

HEALTH SCIENCE



A
GUIDE
TO
GOALS
AFTER
GRADUATION



MAKE A DIFFERENCE

LAUNCH A REWARDING CAREER IN THE
FAST-GROWING FIELD OF HEALTH SCIENCE

INSIDE: EXPLORE 25 HOT HEALTH SCIENCE CAREERS

MEET YOUNG HEALTH CARE PROFESSIONALS

UNDERSTAND YOUR EDUCATION OPTIONS



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THE WORLD OF HEALTH SCIENCE

HEALTH CARE
IS EVERYWHERE

HOME



The aging of the Baby Boomers born from 1945 to 1964 has increased the need for home health care workers. Seniors who want to live independently in their homes rely on others to help them with medications and tasks of daily living, as well as physical and occupational therapy.

GLOBAL



Health professionals from the United States travel around the world to deliver life-saving and life-changing health care and medical supplies to victims of war, natural disasters, and extreme poverty.

COMPUTERS



High-tech tools such as electronic medical record systems, electronic patient monitoring systems, and barcode verification technology help prevent medical errors and protect patient safety.

COMMUNITY



Places in which people have parks, sports fields, and other recreation areas to help them stay healthy, are ones that attract new businesses and jobs, new residents and visitors, and new opportunities for all.

HOSPITAL



In addition to doctors and nurses, hospitals need technicians, therapists, support staff, administrators, pharmacists, aides, and specialists to treat patients around the clock.

INDUSTRY



Occupational health professionals help employees stay safe, avoid absenteeism, and remain productive through on-site clinics and health education programs. A healthier workforce helps boost economic development and attract new business—which benefits everyone.

SPORTS



From little league to the Olympics, athletes rely on Health Science professionals to help them avoid injury and achieve peak performance. Athletic trainers, fitness specialists, nutritionists and physical therapists are the most valuable players on any professional sports team.

BEAUTY



For many people, cosmeticsurgery, dermatology, and dental procedures are the next best thing to a Fountain of Youth. Helping slow the aging process is big business requiring skilled health professionals to administer treatments.

COLLEGE



Curing and preventing disease, developing more effective medicines, discovering how genes affect human health, and inventing life-saving technologies are all examples of how Health Science researchers at colleges and universities improve lives.

MILITARY



In addition to treating wounded soldiers and civilians, military personnel work with local populations to improve health and hygiene, provide safe drinking water, administer disease-preventing vaccinations, and set up clinics.

SCHOOL



From school nurses to faculty members at colleges, Health Science professionals are instilling healthy habits in children, helping college students stay safe, and teaching the next generation of health care providers.

AND MORE

Look around your world for health care in action. If you want to enter a career field with limitless possibilities, invest your time, talent, and energy in Health Science.



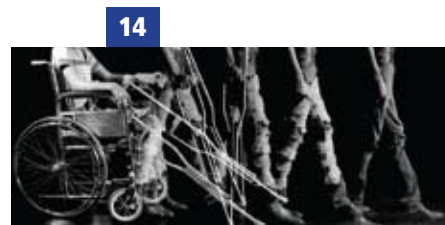
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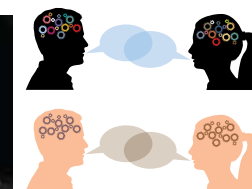
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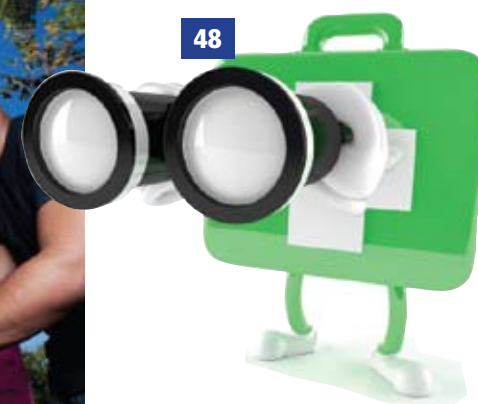
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Take this quick quiz to begin to figure out if Health Science is the right field for you. Answer “yes” or “no” to the ten questions below.

Do YOU Have What It Takes?

1 Do you enjoy helping people? **YES or NO**
WHY IT COUNTS: Every job in Health Science is connected to people. Even if you don’t deliver care or services directly to another person, chances are that the work you are doing will help others in some way.

2 Are science and math two of your best or favorite subjects? **YES or NO**
WHY IT COUNTS: The language of Health Science relies on numbers and knowledge of how the human body works. Whether you want to earn a technical certificate in high school or continue to medical school after earning an undergraduate degree, a solid foundation in math and science is a must.



3 Have you ever helped care for a sick, disabled, or aging relative, neighbor, or pet? **YES or NO**
WHY IT COUNTS: Hands-on Health Science jobs such as nursing and home health provider require patience and compassion. Students with personal experience as caregivers better appreciate the challenges and rewards of caring for others.



4 Do you enjoy hands-on laboratory science projects? **YES or NO**
WHY IT COUNTS: The answers to all sorts of health-related questions are discovered in laboratories. Whether you are a technician testing a patient’s blood cholesterol level or a research scientist investigating the causes of Alzheimer’s disease, your laboratory skills can produce the information others need to make the best possible decisions.

5 Do you try to exercise regularly and eat healthy foods? **YES or NO**
WHY IT COUNTS: If you’re already focused on wellness and fitness, then you can turn your passion into a career by helping others achieve their highest potential for health. Nutritionists, health educators, fitness specialists, and family-practice physicians all help people make healthier choices to improve their overall quality of life.



6 Are you a detail-oriented person? **YES or NO**
WHY IT COUNTS: When it comes to interpreting health data, measuring medicine dosages, or collecting vital patient information, you can’t be sloppy or careless. Precision counts when lives are at stake. If following directions exactly and keeping a detailed schedule are important to you, you’ll enjoy the structure of Health Science.

7 Do you enjoy participating in community service or volunteer activities? **YES or NO**

WHY IT COUNTS: The greatest rewards of health-related careers can’t be measured simply by how much you earn. If you’re a person who genuinely enjoys helping others as a volunteer, then Health Science offers an opportunity to get paid for something you love to do.

8 Do you play team sports, play in a band, or belong to a service group? **YES or NO**
WHY IT COUNTS: Being able to work on a team is essential for success in Health Science. Whether you are part of a trauma team in a hospital emergency department or a member of a team of researchers working to develop a cancer cure, your contributions are added to the work of others to achieve a healthy outcome.

9 Do you like working with high-tech tools? **YES or NO**
WHY IT COUNTS: Health Science relies on the latest technologies to protect patient privacy and safety, manage medical and insurance data, diagnose and treat sickness, and invent more effective drugs.

10 Are you good at solving problems? **YES or NO**
WHY IT COUNTS: Illness, injury, and disease are all problems requiring solutions. Often, solving a health-related problem is like putting together a puzzle. People who can take little pieces of information and see a pattern or an entire picture are needed to make accurate diagnoses and develop effective treatment plans.



QUIZ RESULTS

If you answered “yes” to one or more of the questions at left, then you may have what it takes to succeed in a Health Science field. To get a more specific and scientific measurement of your interests and abilities, ask your school counselor or teacher about taking a career assessment test or interest inventory (see below). It’s smart to do a lot of research into your options before you settle on any particular education or career pathway. This quiz is only a starting point designed to help you begin to assess your interest in Health Science. Use the information you learned about yourself by taking the quiz to start looking into careers that interest you. Do more digging and consult your parents/guardian, counselors, and teachers for their ideas and advice before making any final decisions.



The two-semester Polysomnographic Technologist

ALABAMA

certificate program at Wallace State Community College (www.wallacestate.edu) in Hanceville gives students the high-tech and hands-on skills needed to work as sleep lab technicians in the fast-growing field of sleep medicine.



Illisagvik College (www.illisagvik.cc), a two-year tribal

ALASKA

college located in Barrow, offers a summer allied health camp for students interested in emergency health care. The camp is free to North Slope Borough high school juniors, seniors, or recent graduates.

CAREER ASSESSMENTS AND RESEARCH RESOURCES

Career assessments, interest inventories, and occupational databases help connect your talents, strengths, and interests to real careers. Use one or more of these websites as a starting point for your college and career searches.

- This page, www.khake.com/page51.html, at the **Vocational Information Center**, offers links to scores of sources of education and career information.
- Assess your skills on this page at **Career OneStop**: www.careeronestop.org/SKILLS/SkillCenterHome.asp#AssessYourSkills.

■ **Myers-Briggs**, www.myersbriggs.org, features the most widely used personality assessment system.

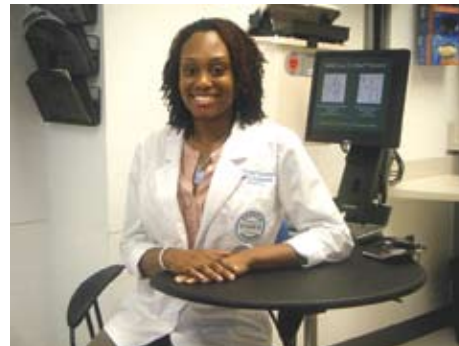
■ **The Occupational Outlook Handbook** online, www.bls.gov/oco, is the Web version of the venerable source of career information.

■ **OSCAR** (Occupation and Skill Computer-Assisted Researcher), www.ioscar.org, features career search tools available to students and counselors.

■ **O*NET** (Occupational Information Network), online.onetcenter.org, gives information on occupations, wages, employment prospects, and skill matching.

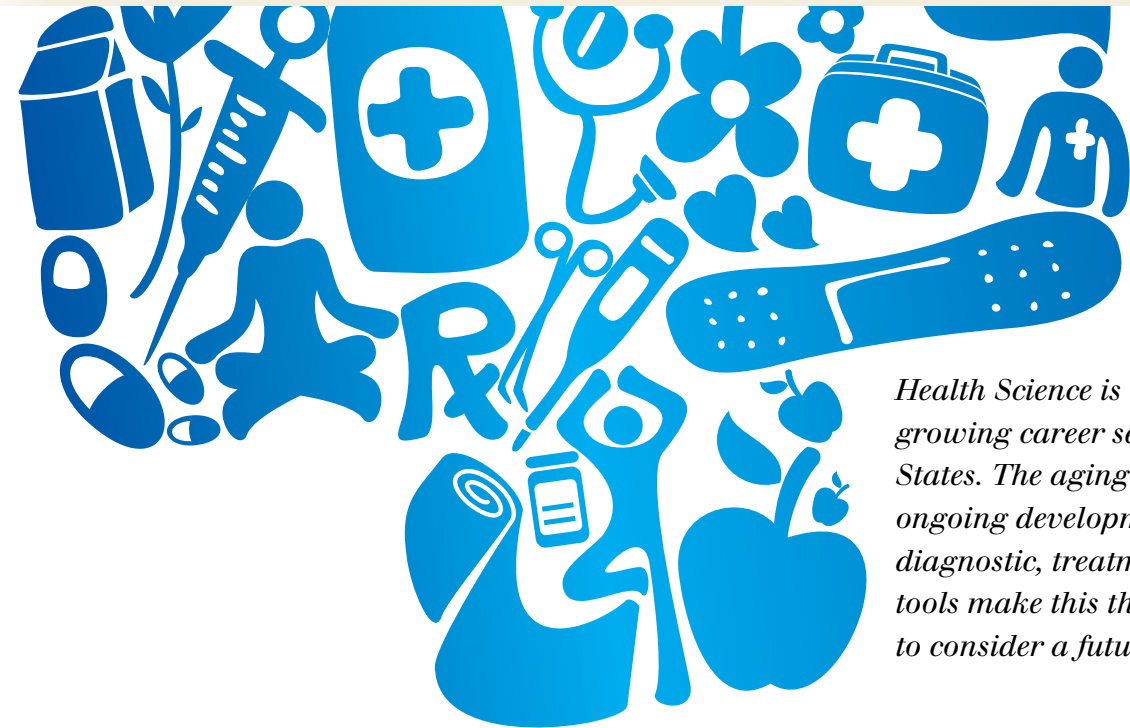
SCHOOL: Bowie State University, Bowie, Maryland

"I think everybody can be smart as long as he or she knows how to study and use his or her time productively," Briggs adds. "Getting a 4.0 [GPA] in school is all about how much time you are willing to put into learning. My strategy is to go to all my classes and participate in discussions. When I have a test to study for, I review my notes and repeat them to myself until I understand everything."



—SHAWNITA BRIGGS

Health Science Careers



Health Science is one of the fastest-growing career sectors in the United States. The aging of America and the ongoing development of high-tech diagnostic, treatment, and research tools make this the ideal time for you to consider a future in health care.

Source: U.S. Bureau of Labor Statistics 2008–2018 projection series

Want to focus your Health Science studies on a sector where the job outlook is brightest? Start by researching the hot, high-demand Health Science jobs at left selected by the U.S. Bureau of Labor Statistics.

The growing demand for Health Science professionals means that now is the ideal time for people from every background, community, and interest area to build futures in health care fields.

Health Science is for EVERYONE



■ NOT A PEOPLE PERSON? NO PROBLEM There's no way around it: Health Science focuses on keeping the human body running smoothly, so many of the careers in this sector involve dealing directly with patients. Not everyone is a people person, however, and that's okay. In Health Science, there are plenty of careers behind the scenes, especially in the field of clinical laboratory science.

Clinical laboratory scientists and other laboratory personnel are the people who conduct the experiments, testing, and analyses required to determine, among other things, whether a tumor is cancerous, how to best treat a blood disorder, and how a patient's body is responding to potentially lifesaving medications.

Working in a laboratory setting still means you will have to work well with others and demonstrate teamwork skills. Clinical laboratory professionals collaborate with physicians, researchers, and other health care professionals in disease investigation, consultation, and interpretation of laboratory results. Their jobs just don't involve dealing directly with patients or their family members.

Here are five fast-growing medical lab-related jobs where you could make a difference in the lives of people you may never meet.

1. MEDICAL TECHNOLOGISTS AND MEDICAL LABORATORY TECHNICIANS perform many routine and complex tests that help the physician diagnose and treat the patient.

2. CYTOGENETICISTS are highly skilled professionals who specialize in analyzing tissue samples to detect genetic abnormalities.

3. CYTOLOGISTS study cells microscopically to determine whether the cells are normal or abnormal.

4. HISTOLOGISTS prepare tissue specimens for examination by cytologists and pathologists.

5. DENTAL LABORATORY TECHNICIANS make and repair orthodontic devices such as dentures, bridges, crowns, and braces.



■ NURSING ISN'T FOR GIRLS ONLY

If you're a male who thinks guys can't be nurses, then you're missing the chance to break into a high-paying, high-reward occupation. The U.S. Department of Labor estimates that there could be a shortage of 800,000 nurses by the year 2020. To recruit and retain talented nurses, many hospitals are paying signing bonuses of \$10,000 or more. And for young men who want to travel the country or the world, a career as a travel nurse

offers the chance to work in a variety of locations for short periods of time.

The myth or stereotype that only women can be nurses is outdated, old-fashioned, and just plain wrong. The National Sample Survey of Registered Nurses, published every four years by the U.S. Department of Health and Human Services, reports that men make up 6 percent of the 2.9 million nurses registered nationwide, an increase of more than 20,000 men in nursing since 2000. Men who enter a nontraditional field like nursing bring unique qualities, strengths, and insights that benefit both their profession and their patients.

If you're a young man who enjoys helping people and using the latest high-tech tools, is willing to work hard in a team setting, and can handle the fast-paced field of health care, you'll find a world of exciting opportunities in nursing. Learn more at www.discovernursing.com.

■ HIGH-TECH HEALTH SCIENCE

Enjoy working with computers, solving problems using electronic tools, or communicating using the latest smart devices? Then there is definitely a place for you in Health Science. Health-related technologies advance at lightning speed, so young, tech-savvy professionals are vital to helping health care personnel, facilities, and programs keep pace. Take a look at five key areas in which Health Science and high tech intersect to create opportunities for students with solid technical skills.



BARCODE VERIFICATION TECHNOLOGY is used in hospitals and other health care facilities to monitor and record all drugs that patients are given, to reduce medication errors, to protect patient privacy, and to help providers use data to make smart decisions.

ELECTRONIC MEDICAL RECORDS enhance patient safety and privacy protection while ensuring faster, more precise communication among doctors, nurses, and other hospital personnel.

PICTURE ARCHIVING AND COMMUNICATION SYSTEMS (PACS) digitize and process high-resolution medical images in a fraction of the time it takes to process traditional film.

TELE-HEALTH SOLUTIONS connect medical specialists located anywhere around the globe with patients or medical students in other locations requiring their expertise. Real-time transmissions are sent via secure computer networks with audio and video aligned precisely.

TELEMONITORING helps seniors, people with disabilities, and those recovering from illness or injury live safely and independently at home. An easy-to-use tabletop device provides in-home electronic links, including a video feed so that health care providers can see and talk to patients, as well as monitor vital signs.

Graduates of the one-year University of California

CALIFORNIA

at San Francisco (www.globalhealthsciences.ucsf.edu) global health sciences (GHS) master's degree program are prepared for leadership careers in international health policy, health care, and research and development. The program is limited to 30 students and emphasizes hands-on global health practice.

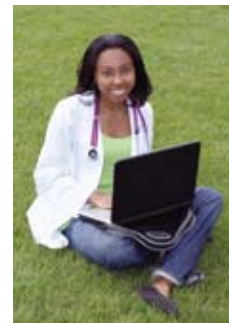


STATE BY STATE

The Children's Hospital in Denver sponsors a program

COLORADO

(www.ucdenver.edu/academics/colleges/nursing/programs-admissions/masters-programs/Documents/TCH_Tuition_Repayment.pdf) that repays tuition of up to \$25,000 before taxes to University of Colorado Denver bachelor of science in nursing students who are bilingual in English and Spanish.



■ HEALTH SCIENCE SCHOLARSHIPS FOR MINORITY STUDENTS

Numerous organizations work to improve higher education opportunities for minority students such as African Americans, American Indians, Latinos, Native Alaskans, and Native Hawaiians underrepresented in the Health Science field. Below is a quick list of some major programs offering Health Science minority scholarships, fellowships, or internships. For more scholarship ideas, talk to your school counselor, launch an Internet scholarship search, and talk to the financial aid officers at the colleges to which you are interested in applying.

INDIAN HEALTH SERVICE HEALTH PROFESSIONALS PROGRAMS provide scholarships for students enrolled in a federally recognized tribe who are pursuing a degree in a health-related profession. Go to: www.ihs.gov/JobCareerDevelop/DHPS/Scholarships/index.cfm.

The **NATIONAL BLACK NURSES ASSOCIATION (NBNA)** awards various scholarships to African American nursing students enrolled in a two-year or four-year nursing, diploma, or licensed practical nursing program. An applicant must be a member of NBNA. Go to: www.nbna.org.

The **SUMMER SCHOLARS PROGRAM** at the Ohio University College of Osteopathic Medicine is an intensive, six-week session designed to help economically or educationally disadvantaged students and underrepresented minority students prepare for the challenges and rewards of medical school. The free program includes a small stipend. Go to: www.oucom.ohiou.edu/SummerScholars/.

The University of Connecticut Health Center

CONNECTICUT

sponsors "doctors academies" for 11th and 12th graders interested in medicine, dental medicine, or biomedical research (medicine.uchc.edu/prospective/enrichment/hcop/index.html). Students must meet certain socioeconomic guidelines and demonstrate potential to go to a four-year college.



STATE BY STATE

The 660-hour massage therapy program at the

DELAWARE

Academy of Massage and Bodywork (www.massage-academy.com) in Bear is approved by the Delaware Department of Education. It prepares students to be licensed massage therapists in states that require passing a national certification exam.

MEET A HEALTH SCIENCE STUDENT

NAME: **Brittni Farmer**

MAJOR: Nursing

SCHOOL: California State University, Los Angeles, California

BRITJNI FARMER WANTS TO become a labor and delivery nurse to help bring new lives into the world. She’s particularly motivated to be a mentor and role model for patients and students of color.

“Many African Americans and other underserved minority members don’t seek medical care or are uncomfortable in health care settings because of the vast cultural differences that exist between practitioners and patients,” Farmer says. “If more students of color became nurses and doctors, then they could be the faces of health care in their communities.”

Farmer chose California State University at Los Angeles after graduating from Arlington High School in Riverside, California, because she could commute from home via train. She was able to afford the in-state tuition and books by taking out low-interest student loans, earning scholarships, and working over the summer as a cashier at Staples. In her first two years at Cal State, she has focused on making the highest possible grades in her general education courses. Next, she’ll apply to the School of Nursing’s basic nursing program. This full-time undergraduate program will begin her junior year, and lead to a bachelor of science in nursing degree.

In addition to a strong academic record and personal references, admission to the demanding nursing program requires relevant work or volunteer experience and satisfactory scores on the TEAS (Test of Essential Academic Skills). “Our nursing program is very competitive,” she explains. “There are thousands of students enrolled who want to pursue nursing careers, but only a few hundred get selected. I believe that the competition pushes everyone to work harder. We understand that if we don’t study and if we do poorly on a test, it could hurt our chances of being selected for nursing school. There are so many qualified applicants. You have to be motivated and stay focused on your schoolwork.”

Farmer says she’s observed that unlike high school teachers, college professors don’t give students a second chance on quizzes or tests that they have failed. And since professors can refuse to let students into a class if they show up late, Farmer times her long commute from Riverside to allow extra time for traffic and other potential delays.

“I used to drive to campus, but the traffic was so bad it could take me two hours or more to get there,” she says. “I’d wake up at 5 a.m. to make sure I made it to my 10 a.m. class on time. Commuting definitely is an option if you don’t think you can afford to live at college. If you want to be successful in life, you have to be willing to do whatever it takes to get an education.”



INSIDE SCOOP: “*Since I knew I wanted to go to nursing school, I took four years of math and four years of science in high school. Having that basic understanding really helps you in college, where you are covering the same subjects at a more advanced level and a more rigorous pace.*”

—BRITJNI FARMER

Read on to see where continuing your Health Science education after high school graduation can take you.

How FAR Do You Want to Go?

A LADDER TO UNLIMITED OPPORTUNITIES

Check out the nursing career path below to see how lifelong learning can help you climb the ladder of success. Similar opportunities for advancement are available in many other Health Science specialties.

STEP ONE: Take a year to launch your career. Become a licensed practical nurse (LPN) or licensed vocational nurse (LVN) via a 12- to 16-month program offered by a technical, community, or vocational college.

STEP TWO: Move up to a bigger paycheck and better benefits. **OPTION 1:** Earn a hospital diploma through a two- to three-year hospital-based nursing program. **OPTION 2:** Move up to being a registered nurse (RN) by getting an associate’s degree in nursing (ADN) through a two- to three-year program at a community or technical college. **OPTION 3:** Become an RN by earning a bachelor of science degree in nursing (BS/BSN) in a four-year program at a college or university.

STEP THREE: Increase responsibility, independence, and salary. Earn a bachelor’s degree through online, evening, flexible scheduling, or on-site programs available to LPNs and RNs with diplomas and associate’s degrees, or enter a master of science in nursing (MSN) degree program to become a better-paid nurse practitioner, clinical nurse specialist, nurse-midwife, nurse anesthetist, nurse psychotherapist, or health care administrator or manager.

STEP FOUR: Take the lead and earn the rewards. If you are really ambitious, earn a doctoral degree (Ph.D., Ed.D., DNS, DNP), with which nurses become leaders in their profession as nursing school deans, researchers, executives, analysts, and college faculty members.

STEP FIVE: Never stop learning. Post-doctoral programs offer advanced training at research-focused universities for the most educated—and best paid—nurses in the profession.



EARN WHILE YOU LEARN

Health Science is a field in which it is possible to earn a paycheck while you build knowledge and skills, and even have your employer pay for additional education and training. So if you’re not sure what specific job in Health Science is right for you, you could start by earning a one-year postsecondary certificate or two-year associate’s degree in a health-related major, land a job in a hospital or doctor’s office, and then learn more about the other career options available while you make money.

If you work hard and are eager to learn new things, you may even qualify for an employer-sponsored tuition reimbursement or repayment program. Basically, that means your employer pays part or all of your tuition for further Health Science education or training. This

(continued on next page)

The George Washington University School of Public

WASHINGTON, D.C.

Health and Health Services (sphhs.gwuvmc.edu) offers the district’s only bachelor of science degree major in athletic training. The program is nationally accredited by the Commission on Accreditation of Athletic Training Education programs.



Students enrolled in Daytona State College’s health

FLORIDA

care programs (www.daytonastate.edu) in Daytona Beach get hands-on career experience using three adult simulators, one pediatric simulator, and one infant simulator housed in the campus Human Patient Simulator (HPS) Lab.

STATE BY STATE

Students applying to the highly competitive, 24-month

GEORGIA

radiologic technology program at Lanier Technical College (www.laniertech.edu) in Oakwood are required to job shadow for up to 20 hours in a radiology department before scheduling an admissions interview. The on-the-job experience helps students better appreciate what it’s really like to work in the radiology profession.

How FAR Do You Want to Go?

(continued from previous page)

could mean working as an x-ray technician while earning a bachelor's degree in nuclear medicine, or perhaps completing a bachelor of science degree in nursing while working as a registered nurse.

Tuition reimbursement programs typically require you to continue working for the employer who helped pay your education bills for a specified number of years after you get your degree or certificate. Some employers offer reimbursement for tuition expenses related directly to a health care profession at any accredited university up to a certain maximum amount, such as \$3,000 or \$5,000 per year. Others give 90 to 100 percent tuition reimbursement for training or education in critical-need fields, such as primary care medicine for medically underserved communities.

To learn more about tuition reimbursement, check out the websites of hospitals and other health care employers in your state or local community. Go to the employment section of the website and look at the list of benefits offered to employees. Although you may not be qualified for any of the posted job openings right now, you can see how earning money in a health-related field can lead to learning that is free or deeply discounted.



■ HEALTH CARE ALPHABET SOUP Exploring health-related career opportunities can be confusing because the job titles often look like a jumble of letters. Complicating things even more, some abbreviations can stand for a lot of different certifications. For instance, RT can stand for radiation technician, radiation technologist, or respiratory therapist. As you learn more about health care career options, do internet research to discover what all the letters mean (and to find out what education and training is required to earn each title.) To get you started, here are five fast-growing career titles from the health care career alphabet soup.



CAP = CERTIFIED ADDICTION PROFESSIONAL A substance abuse counselor with a bachelor's degree who has 6,000 hours of work experience, 300 hours of direct supervision, and 300 hours of education, and who has passed written and oral exams.

DO = DOCTOR OF OSTEOPATHIC MEDICINE A medical doctor who has had additional training in the musculoskeletal system and who focuses on whole-person care.

NP = NURSE PRACTITIONER A registered nurse who has earned a master's degree and has advanced training in the diagnosis and management of common medical conditions.

OD = OPTOMETRIST A doctor trained specifically to diagnose and treat eye diseases and injuries.

OT = OCCUPATIONAL THERAPIST A licensed, master's-level specialist who helps people with mental, physical, developmental, or emotional disabilities improve their ability to perform daily living and work tasks. A sister profession is PT, or physical therapist.

The University of Hawaii
Maui College in Kahului

HAWAII

(www.maui.hawaii.edu) offers programs designed to help Maui residents fill essential allied health jobs on the island.

The college's mission and goals are guided by the Native Hawaiian reverence for the ahupua'a—the sustaining and sharing of diverse but finite resources for the benefit of all.



The University of Idaho
in Moscow is part of the

IDAHO

Washington, Wyoming, Alaska, Montana, and Idaho (WWAMI) (www.webs.uidaho.edu/wwami/pi) regional medical education program. WWAMI focuses on meeting the health care needs of the Northwest U.S. by making public medical education more accessible to residents.

MEET A HEALTH SCIENCE STUDENT

NAME: **Michael Whitehead**

OCCUPATION: Radiologic Technologist at Baptist Hospital of Cocke County, Newport, Tennessee

SCHOOLS: Nuclear Medicine Major, South College, Knoxville, Tennessee

WHEN MICHAEL WHITEHEAD WAS a student at Cocke County High School in Tennessee, he had to have some x-rays taken.

"I was amazed at how the x-rays worked," Whitehead says. "I then began exploring what classes I should be taking in high school to prepare me for college. During my research, I also discovered that there are many career opportunities available within imaging, including general x-ray, CT (computed tomography), MRI (magnetic resonance imaging), ultrasound, and nuclear medicine." Whitehead was convinced he wanted to continue his education in imaging sciences.

To give himself the best chance for success in a Health Science college program, Whitehead took all the high school science courses he could fit into his schedule. In addition, he sought out volunteer opportunities in health care-related settings.

"I feel I was very prepared for college after high school," he explains. "I would recommend that anyone wanting to go into the health field take as many science classes as possible, and always try to push yourself. Never give up. One thing that I wish I had done differently in high school was to volunteer more. I would encourage students who are interested in a health field to research that career by volunteering in the field of their choice."

After high school, Whitehead attended Walters State Community College for one and a half semesters before transferring to South College to major in Health Science with a concentration in nuclear medicine. He graduated summa cum laude in June 2010 with an associate of science degree in radiography.

Although his associate's degree enabled Whitehead to land a job as a radiologic technologist (RT) at Baptist Hospital of Cocke County, he decided to continue his education while working. He is enrolled in South College's nuclear medicine program, and will graduate in June 2011 with a bachelor of science degree with a concentration in nuclear medicine.

Being a lifelong learner is important to Whitehead, who believes that gaining additional training, knowledge, and experience will help advance his career and lead to new personal and professional opportunities. "I feel it is important to be able to do as many things as possible. That's why I am going back to school to become certified in nuclear medicine. It is important to understand that health care is a field that changes continually. For example, people are always discovering new and better ways to perform a certain procedure. The health care worker must be able to adapt to change to provide the best patient care possible. Your education is never complete. Yes, you may graduate and no longer have to attend class, but you can learn new things every day."



INSIDE SCOOP: *"There are many women in health care, but health care is for anyone who wants to contribute to his or her community in a positive way. Health care is very rewarding for both men and women. Young men sometimes let what others might think or say influence their decisions. I would encourage them—and everyone else—to choose their career path based on what will make them happy."*
—MICHAEL WHITEHEAD



The new interdisciplinary
i-Health program at the

ILLINOIS

University of Illinois at Urbana-Champaign College of Applied Health Sciences (ihealth.illinois.edu) prepares undergraduate students for a wide range of graduate study in health-related fields, and offers pre-professional study for a range of biomedical careers.

25 Health Careers



Explore ideas for more than two dozen jobs that span the different education levels required to enter a Health profession.

#	SOC	JOB TITLE	EDUCATION	WAGES	OUTLOOK
1	29-9091	ATHLETIC TRAINER	▤▤▤▤	\$\$\$	👍👍
2	29-1021	DENTIST, GENERAL	▤▤▤▤▤▤	\$\$\$\$\$	👍👍
3	29-2031	CARDIOVASCULAR TECHNOLOGIST	▤▤▤▤	\$\$\$	👍👍👍
4	29-2061	LICENSED PRACTICAL AND LICENSED VOCATIONAL NURSE	▤▤▤	\$	👍👍
5	29-1062	PHYSICIAN AND SURGEON, FAMILY AND GENERAL PRACTITIONER	▤▤▤▤▤▤	\$\$\$\$\$	👍👍👍
6	29-1031	DIETITIAN AND NUTRITIONIST	▤▤▤▤▤	\$\$\$	👍👍
7	29-2021	DENTAL HYGIENIST	▤▤▤	\$\$\$\$	👍👍
8	29-2032	DIAGNOSTIC MEDICAL SONOGRAPHER	▤▤▤▤	\$\$\$\$	👍👍
9	31-9094	MEDICAL TRANSCRIPTIONIST	▤▤▤	\$	👍👍
10	29-2041	EMERGENCY MEDICAL TECHNICIAN AND PARAMEDIC	▤▤▤	\$	👍👍
11	29-2011	CLINICAL LABORATORY TECHNOLOGIST	▤▤▤▤▤	\$\$\$	👍👍👍
12	29-9011	OCCUPATIONAL HEALTH AND SAFETY SPECIALIST	▤▤▤▤▤	\$\$\$\$	👍👍
13	29-1131	VETERINARIAN	▤▤▤▤▤▤	\$\$\$\$\$	👍👍👍
14	31-1011	HOME HEALTH AIDE	▤	\$	👍👍👍
15	31-9011	MASSAGE THERAPIST	▤▤▤	\$	👍👍👍
16	31-1013	PSYCHIATRIC AIDE	▤	\$	👍
17	29-1126	RESPIRATORY THERAPIST	▤▤▤▤	\$\$\$	👍👍👍
18	29-1071	PHYSICIAN ASSISTANT	▤▤▤▤▤▤	\$\$\$\$\$	👍👍
19	29-1123	PHYSICAL THERAPIST	▤▤▤▤▤▤	\$\$\$\$	👍👍
20	29-1111	REGISTERED NURSE	▤▤▤▤	\$\$\$\$	👍👍👍
21	31-2011	OCCUPATIONAL THERAPIST ASSISTANT	▤▤▤▤	\$\$\$	👍👍👍
22	31-1012	NURSING AIDE, ORDERLY, AND ATTENDANT	▤	\$	👍👍👍
23	29-1127	SPEECH-LANGUAGE PATHOLOGIST	▤▤▤▤▤▤	\$\$\$\$	👍👍
24	29-2055	SURGICAL TECHNOLOGIST	▤▤▤▤	\$	👍👍👍
25	29-1051	PHARMACIST	▤▤▤▤▤▤▤▤	\$\$\$\$\$	👍👍👍

HOW TO READ THIS CHART On the chart above, you will find 25 career ideas in Health Science. Here are explanations of what abbreviations or symbols mean. For detailed information, please see the occupational descriptions on the following pages.

#
JOB NUMBER

This corresponds to the number of the description of the occupation found on the following pages.

SOC
STANDARD OCCUPATIONAL CLASSIFICATION

Use this number to look up more information about this occupation in career information databases.

EDUCATION

The minimum level of education usually needed to enter the occupation.

- ▤ On-the-job training
- ▤▤ Postsecondary vocational training
- ▤▤▤ Associate's degree
- ▤▤▤▤ Bachelor's degree
- ▤▤▤▤▤ Master's degree
- ▤▤▤▤▤▤ Doctoral degree, first professional degree, or Ph.D.

\$
WAGES

The average pay for the occupation.

- \$.01–10 dollars per hour
- \$ 10.01–20 dollars per hour
- \$ 20.01–30 dollars per hour
- \$ 30.01–40 dollars per hour
- \$ 40.01–50+ dollars per hour

OUTLOOK

Opportunities for finding employment.

- 👍 Keen competition. There may be fewer job openings than job seekers.
- 👍👍 Good or favorable. The number of job openings and the number of job seekers may be roughly equal.
- 👍👍👍 Very good or excellent. There may be more job openings than job seekers.

SOURCE: The information on the chart and for the occupations on the following pages is excerpted from the *Occupational Outlook Handbook, 2010-11 Edition* (www.bls.gov/oco) and O*Net Online (online.onetcenter.org). Inexact or ambiguous data has been interpreted by the editors. These jobs are only ideas; always do additional research to make the right education and career decisions for you.



1

ATHLETIC TRAINER

WHAT YOU DO: Athletic trainers help prevent and treat injuries for people of all ages. Their patients and clients include professional athletes and industrial workers. Recognized by the American Medical Association as allied health professionals, athletic trainers specialize in the prevention, diagnosis, assessment, treatment, and rehabilitation of muscle and bone injuries and illnesses. Athletic trainers try to prevent injuries by educating people on how to reduce their risk for injuries and by advising them on the proper use of equipment, exercises to improve balance and strength, and home exercises and therapy programs. They also help apply protective or injury-preventing devices such as tape, bandages, and braces.

MINIMUM EDUCATION: Bachelor's degree.
AVERAGE WAGES: \$21.16 per hour.*
EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.
SOC: 29-9091.

*The Bureau of Labor Statistics notes that Athletic Trainers may not work a traditional schedule. It lists an annual wage of \$44,020 for the profession; the hourly wage here is based on that salary divided by a 2,080-hour work year.

2

DENTIST, GENERAL

WHAT YOU DO: Dentists diagnose and treat problems with teeth and tissues in the mouth, along with giving advice and administering care to help prevent future problems. They provide instruction on diet, brushing, flossing, the use of fluorides, and other aspects of dental care. They remove tooth decay, fill cavities, examine x-rays, place protective plastic sealants on children's teeth, straighten teeth, and repair fractured teeth. They also perform corrective surgery on gums and supporting bones to treat gum diseases. Dentists extract teeth and make models and measurements for dentures to replace missing teeth. They also administer anesthetics and write prescriptions for antibiotics and other medications.

MINIMUM EDUCATION: Doctoral degree, first professional degree, or Ph.D.
AVERAGE WAGES: \$75.41 per hour.
EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.
SOC: 29-1021.



STATE BY STATE

The associate's degree program in optometric

INDIANA

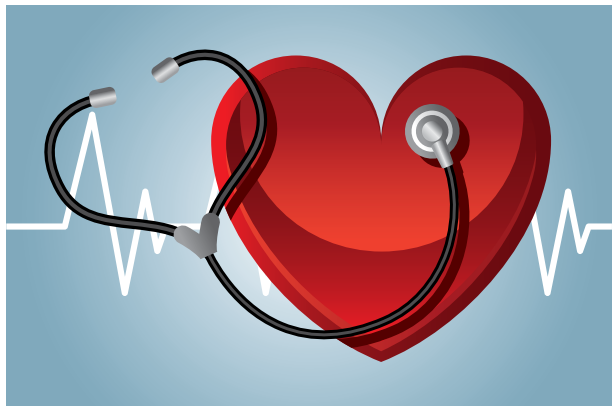
technology/opticianry at the Indiana University School of Optometry (www.opt.indiana.edu) is the nation's only optometric technician or optician program located at a school or college of optometry. Students work in the state-of-the-art clinical facilities at the Bloomington campus.

3

CARDIOVASCULAR TECHNOLOGIST

WHAT YOU DO: Cardiovascular technologists assist physicians in diagnosing and treating cardiac (heart) and peripheral vascular (blood vessel) ailments. Cardiovascular technologists schedule appointments, review physicians' interpretations and patient files, and monitor patients' heart rates. They also operate and care for testing equipment, explain test procedures, and compare findings to a standard to identify problems. Other day-to-day activities vary significantly between specialties. Technologists may specialize in different areas of practice: invasive cardiology, non-invasive cardiology, or vascular technology, for example.

MINIMUM EDUCATION: Associate's degree.
AVERAGE WAGES: \$23.91 per hour.
EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.
SOC: 29-2031.



4

LICENSED PRACTICAL AND LICENSED VOCATIONAL NURSE

WHAT YOU DO: Licensed practical nurses (LPNs), or licensed vocational nurses (LVNs), care for people who are sick, injured, convalescent, or disabled under the direction of physicians and registered nurses. Often, LPNs provide basic bedside care. Many measure and record patients' vital signs, such as height, weight, temperature, blood pressure, pulse, and respiration. They also prepare and give injections and enemas, monitor catheters, dress wounds, and give alcohol rubs and massages. To help keep patients comfortable, they assist with bathing, dressing, personal hygiene, moving in bed, standing, and walking.

MINIMUM EDUCATION: Postsecondary training.
AVERAGE WAGES: \$19.66 per hour.
EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.
SOC: 29-2061.

5

PHYSICIAN AND SURGEON, FAMILY AND GENERAL PRACTITIONER

WHAT YOU DO: Physicians and surgeons diagnose illnesses and prescribe and administer treatment for people suffering from injury or disease. Physicians examine patients; obtain medical histories; and order, perform, and interpret diagnostic tests. They counsel patients on diet, hygiene, and preventive health care. In the role of traditional family physician, family and general physicians often provide the first point of contact for people seeking health care. They assess and treat conditions as varied as sinus and respiratory infections and broken bones. Family and

general physicians typically have a base of regular, long-term patients. These doctors refer patients with more serious conditions to specialists or other health care facilities for more intensive care.

MINIMUM EDUCATION: Doctoral degree, first professional degree, or Ph.D.
AVERAGE WAGES: \$81.03 per hour.
EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.
SOC: 29-1062.



6

DIETITIAN AND NUTRITIONIST

WHAT YOU DO: Dietitians and nutritionists plan food and nutrition programs, supervise meal preparation, and oversee the serving of meals. They prevent and treat illnesses by promoting healthy eating habits and recommending dietary modifications. Dietitians manage food service systems for institutions such as hospitals and schools, promote sound eating habits through education, and conduct research. Many dietitians specialize, becoming a clinical dietitian, community dietitian, management dietitian, or consultant.

MINIMUM EDUCATION: Bachelor's degree.
AVERAGE WAGES: \$25.59 per hour.
EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.
SOC: 29-1031.



STATE BY STATE

Every graduate of the University of Iowa College of

IOWA

Nursing Anesthesia nursing program (anesthesia.nursing.uiowa.edu) in Iowa City has found a job as a certified registered nurse anesthetist (CRNA) after passing the national certification exam.

7

DENTAL HYGIENIST

WHAT YOU DO: Dental hygienists remove soft and hard deposits from teeth, teach patients how to practice good oral hygiene, and provide other preventive dental care. They examine patients' teeth and gums, recording the presence of diseases or abnormalities. Dental hygienists use an assortment of tools to complete their tasks. Hand and rotary instruments and ultrasonic devices are used to clean and polish teeth, a process that includes removing tartar, stains, and plaque. Hygienists use x-ray machines to take dental pictures, and sometimes develop the film. They may use models of teeth to explain oral hygiene, perform root planning as a periodontal therapy, or apply cavity-preventive agents such as fluorides and pit and fissure sealants.



MINIMUM EDUCATION: Postsecondary vocational training.

AVERAGE SALARY: \$32.63 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-2021.

8

DIAGNOSTIC MEDICAL SONOGRAPHER

WHAT YOU DO: Diagnostic imaging encompasses several procedures that aid in diagnosing ailments. The most familiar procedures are the x-ray and magnetic resonance imaging; however, not all imaging technologies use ionizing radiation, or radio waves. Sonography, or ultrasonography, is the use of sound waves to generate an image for the assessment and diagnosis of various medical conditions. Sonography is commonly associated with obstetrics and the use of ultrasound imaging during pregnancy; this technology also has many other applications in the diagnosis and treatment of medical conditions throughout the body.

MINIMUM EDUCATION: Associate's degree.

AVERAGE WAGES: \$30.60 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-2032.



STATE BY STATE

Kansas State University
(www.k-state.edu) in

KANSAS

Manhattan is one of the few places in the nation where undergraduate students can take drama therapy courses. Drama therapy is used to help victims of abuse; children with physical, mental, and learning disabilities; recovering substance addicts; and Alzheimer's patients.

9

MEDICAL TRANSCRIPTIONIST

WHAT YOU DO: Medical transcriptionists listen to dictated recordings made by physicians and other health care professionals and transcribe them into medical reports, correspondence, and other administrative material. They generally listen to recordings on a headset, using a foot pedal to pause the recording when necessary, and key the text into a personal computer or word processor, editing as necessary for grammar and clarity. The documents they produce include discharge summaries, medical history and physical examination reports, operative reports, consultation reports, autopsy reports, diagnostic-imaging studies, progress notes, and referral letters. These documents eventually become part of patients' permanent files. To understand and accurately transcribe dictated reports, medical transcriptionists must understand medical terminology, anatomy and physiology, diagnostic procedures, pharmacology, and treatment assessments.

MINIMUM EDUCATION: Postsecondary training.

AVERAGE WAGES: \$16.03 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 31-9094.

10

EMERGENCY MEDICAL TECHNICIAN AND PARAMEDIC

WHAT YOU DO: People's lives often depend on the quick reaction and competent care of emergency medical technicians (EMTs) and paramedics. Incidents as varied as automobile accidents, heart attacks, slips and falls, childbirth, and gunshot wounds require immediate medical attention. EMTs and paramedics provide this vital service as they care for and transport the sick or injured to a medical facility. In an emergency, EMTs and paramedics are typically dispatched by a 911 operator to the scene, where they often work with police and firefighters.

MINIMUM EDUCATION:

Postsecondary vocational training.

AVERAGE WAGES: \$15.88 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-2041.



11

CLINICAL LABORATORY TECHNOLOGIST



WHAT YOU DO: Clinical laboratory testing plays a crucial role in the detection, diagnosis, and treatment of disease. Clinical laboratory technologists, also referred to as clinical laboratory scientists, medical technologists, or medical technicians, perform most of these tests. Clinical laboratory personnel examine and analyze body fluids and cells. They look for bacteria, parasites, and other microorganisms; analyze the chemical content of fluids; match blood for transfusions; and test for drug levels in the blood that show how a patient is responding to treatment. Technologists also prepare specimens for examination, count cells, and look for abnormal cells in blood and other body fluids. They use microscopes, cell counters, and other sophisticated laboratory equipment. They

also use automated equipment and computerized instruments capable of performing a number of tests simultaneously. After testing and examining a specimen, they analyze the results and relay them to physicians.

MINIMUM EDUCATION: Bachelor's degree.

AVERAGE WAGES: \$26.74 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-2011.

12

OCCUPATIONAL HEALTH AND SAFETY SPECIALIST

WHAT YOU DO: Occupational health and safety specialists, also known as safety and health professionals or occupational health and safety inspectors, help prevent harm to workers, property, the environment, and the general public. For example, they may design safe work spaces, inspect machines, or test air quality. In addition to making workers safer, specialists aim to increase worker productivity by reducing absenteeism and equipment downtime—and to save money by lowering insurance premiums and workers' compensation payments, as well as preventing government fines. Occupational health and safety specialists analyze work environments and design programs to control, eliminate, and prevent disease or injury.

MINIMUM EDUCATION: Bachelor's degree.

AVERAGE WAGES: \$30.87 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-9011.



STATE BY STATE

The medical coding associate's program at Midway College

KENTUCKY

(www.midway.edu) in Midway prepares students for the field of health information and medical records. Courses include health information management; medical vocabulary; structure and function of the human body; pathological processes; and medical coding, billing, law, and ethics.

13

VETERINARIAN

WHAT YOU DO: Veterinarians diagnose and treat diseases and dysfunctions of animals. Specifically, they care for the health of pets, livestock, and animals in zoos, race-tracks, and laboratories. Most veterinarians diagnose animal health problems, vaccinate against diseases, medicate animals suffering from infections or illnesses, treat and dress wounds, set fractures, perform surgery, and advise owners about animal feeding, behavior, and breeding.



MINIMUM EDUCATION: Doctoral degree, first professional degree, or Ph.D.

AVERAGE WAGES: \$43.32 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-1131.

14

HOME HEALTH AIDES



WHAT YOU DO: Home health aides and personal and home care aides help people who are disabled, chronically ill, or cognitively impaired, as well as older adults who may need assistance, so they can live in their own homes or in residential facilities instead of in health care facilities or institutions. Most aides work with elderly or physically or mentally disabled clients who need more care than family or friends can provide. Others help discharge hospital patients who have relatively short-term needs.

Aides provide light housekeeping and homemaking tasks such as doing laundry, changing bed linens, shopping for food, and planning and preparing meals. Aides may also help clients get out of bed, bathe, dress, and groom.

MINIMUM EDUCATION: On-the-job training.

AVERAGE WAGES: \$10.39 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 31-1011.

15

MESSAGE THERAPIST

WHAT YOU DO: Massage therapy is the practice of using touch to manipulate the soft-tissue muscles of the body. It is performed for a variety of reasons, including treating painful ailments, decompressing tired and overworked muscles, reducing stress, rehabilitating sports injuries, and promoting general health. Massage therapists can specialize in any of more than 80 different types of massage, called modalities. Swedish massage, deep-tissue massage, reflexology, acupressure, sports massage, and neuromuscular massage are just a few of the many approaches to massage therapy.

MINIMUM EDUCATION: Postsecondary training.

AVERAGE WAGES: \$19.13 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 31-9011.



16

PSYCHIATRIC AIDE

WHAT YOU DO: Psychiatric aides, also known as mental health assistants or psychiatric nursing assistants, care for mentally impaired or emotionally disturbed individuals. They work under a team that may include psychiatrists, psychologists, psychiatric nurses, social workers, and therapists. In addition to helping patients to dress, bathe, and groom themselves, as well as eat, psychiatric aides socialize with them and lead them in educational and recreational activities. They observe patients and report any physical or behavioral signs that might be important for the professional staff to know. Because they have such close contact with patients, psychiatric aides can have a great deal of influence on their outlook and treatment.

MINIMUM EDUCATION: On-the-job training.

AVERAGE WAGES: \$13.19 per hour.

EMPLOYMENT OUTLOOK: Keen competition. There may be fewer job openings than job seekers.

SOC: 31-1013.

18

PHYSICIAN ASSISTANT

WHAT YOU DO: Physician assistants (PAs) practice medicine under the supervision of physicians and surgeons. They should not be confused with medical assistants, who perform routine clinical and clerical tasks. PAs are formally trained to provide diagnostic, therapeutic, and preventive health care services, as delegated by a physician. Working as members of a health care team, they take medical histories, examine and treat patients, order and interpret laboratory tests and x-rays, and make diagnoses. They also treat minor injuries by suturing, splinting, and casting. Physician assistants also may prescribe certain medications. Physician assistants work under the supervision of a physician; however, PAs may be the principal care providers in rural or inner-city clinics where a physician is present for only one or two days each week.

19

PHYSICAL THERAPIST

WHAT YOU DO: Physical therapists, sometimes referred to simply as PTs, are health care professionals who diagnose and treat individuals of all ages, from newborns to the very oldest, who have medical problems or other

health-related conditions, illnesses, or injuries that limit their ability to move and perform functional activities as well as they would like in their daily lives. Physical therapists examine each individual and develop a plan using treatment techniques to promote the ability to move, reduce pain, restore function, and prevent disability.

MINIMUM EDUCATION: Master's degree.

AVERAGE WAGES: \$36.64 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-1123.

17

RESPIRATORY THERAPIST

WHAT YOU DO: Respiratory therapists—also known as respiratory care practitioners—evaluate, treat, and care for patients with breathing or other cardiopulmonary disorders. Practicing under the direction of a physician, respiratory therapists assume primary responsibility for all respiratory care therapeutic treatments and diagnostic procedures, including the supervision of respiratory therapy technicians. Therapists also provide complex therapy requiring considerable independent judgment, such as caring for patients on life support in intensive care units of hospitals. Respiratory therapists evaluate and treat all types of patients, ranging from premature infants whose lungs are not fully developed to elderly people whose lungs are diseased. They provide temporary relief to patients with chronic asthma or emphysema and give emergency care to patients who are victims of a heart attack, stroke, drowning, or shock.



MINIMUM EDUCATION: Associate's degree.

AVERAGE WAGES: \$26.06 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-1126.



STATE BY STATE

Delgado Community College
(www.dcc.edu/campus/cpl/)

LOUISIANA

ahealth) in New Orleans was selected to offer a grant-funded, nondegree health information technology training program beginning in fall 2010. Qualified students get free tuition plus a stipend.



STATE BY STATE

The University of Maine at Farmington (www.farmington.edu/)

MAINE

edu) participates in the Tufts Maine Track Early Assurance Program. Pre-med students in good academic standing at the end of their sophomore year are guaranteed admission to medical school at Tufts University.

20

REGISTERED NURSE

WHAT YOU DO: Registered nurses (RNs) treat patients, educate patients and the public about various medical conditions, and provide advice and emotional support to patients' family members. RNs record patients' medical histories and symptoms, help perform diagnostic tests and analyze results, operate medical machinery, administer treatment and medications, and help with patient follow-up and rehabilitation.

MINIMUM EDUCATION: Associate's degree.

AVERAGE WAGES: \$31.99 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-1111.



21

OCCUPATIONAL THERAPIST ASSISTANT



MINIMUM EDUCATION: Associate's degree.

AVERAGE WAGES: \$24.44 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 31-2011.

WHAT YOU DO: Occupational therapist assistants and aides work under the supervision of occupational therapists to provide rehabilitative services to persons with mental, physical, emotional, or developmental impairments. The ultimate goal is to improve clients' quality of life and ability to perform daily activities. For example, occupational therapist assistants help injured workers re-enter the labor force by teaching them how to compensate for lost motor skills, or help individuals with learning disabilities increase their independence. Occupational therapist assistants help clients with rehabilitative activities and exercises outlined in a treatment plan that is developed

in collaboration with an occupational therapist. Activities include teaching the proper method of moving from a bed into a wheelchair and the best way to stretch and limber the muscles of the hand. Assistants monitor an individual's activities to make sure that they are performed correctly and to provide encouragement.



The University of Maryland at Baltimore offers a traditional

MARYLAND

bachelor's degree in dental hygiene, a bachelor's program for hygienists with associate's degrees, and a master's program for hygienists holding bachelor's degrees (www.dental.umaryland.edu/dentaldepts/dhygiene/index.html).

22

NURSING AIDE, ORDERLY, AND ATTENDANT



WHAT YOU DO: Nursing aides, also known as nurse aides, nursing assistants, certified nursing assistants, geriatric aides, unlicensed assistive personnel, orderlies, or hospital attendants, provide hands-on care and perform routine tasks under the supervision of nursing and medical staff. They

MINIMUM EDUCATION: On-the-job training.

AVERAGE WAGES: \$12.01 per hour.

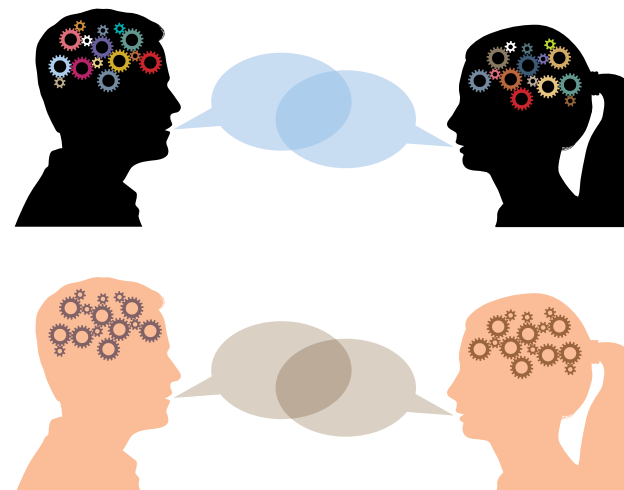
EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 31-1012.

often help patients to eat, dress, and bathe. They also answer calls for help, deliver messages, serve meals, make beds, and tidy up rooms.

23

SPEECH-LANGUAGE PATHOLOGIST



WHAT YOU DO: Speech-language pathologists, sometimes called speech therapists, assess, diagnose, treat, and help to prevent disorders related to speech, language, cognitive communication, voice, swallowing, and fluency. Speech-language pathologists work with people who cannot produce speech sounds or cannot produce them clearly; those with speech rhythm and fluency problems, such as stuttering; people with voice disorders, such as inappropriate pitch or harsh voice; those with problems understanding and producing language; those who wish to improve their communication skills by modifying an accent; and those with cognitive communication impairments, such as attention, memory, and problem-solving disorders.

MINIMUM EDUCATION: Master's degree.

AVERAGE WAGES: \$32.86 per hour.

EMPLOYMENT OUTLOOK: Good or favorable. The number of job openings and job seekers may be roughly equal.

SOC: 29-1127.

24

SURGICAL TECHNOLOGIST

WHAT YOU DO: Surgical technologists, also called scrubs and surgical or operating room technicians, assist in surgical operations under the supervision of surgeons, registered nurses, or other surgical personnel. Surgical technologists are members of operating room teams, which most commonly include surgeons, anesthesiologists, and circulating nurses.

MINIMUM EDUCATION: Postsecondary training.

AVERAGE WAGES: \$19.57 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-2055.



25

PHARMACIST



WHAT YOU DO: Pharmacists distribute prescription drugs to individuals. They also advise their patients, physicians, and other health practitioners on the selection, dosages, interactions, and side effects of medications, as well as monitor the health and progress of those patients to ensure that they are using their medications safely and effectively. Compounding—the actual mixing of ingredients to form medications—is a small part of

a pharmacist's practice, because most medicines are produced by pharmaceutical companies in standard dosages and drug delivery forms. Most pharmacists work in a community setting, such as a retail drugstore, or in a health care facility, such as a hospital.

MINIMUM EDUCATION: Doctoral degree, first professional degree, or Ph.D.

AVERAGE WAGES: \$51.27 per hour.

EMPLOYMENT OUTLOOK: Very good or excellent; may be more job openings than job seekers.

SOC: 29-1051.



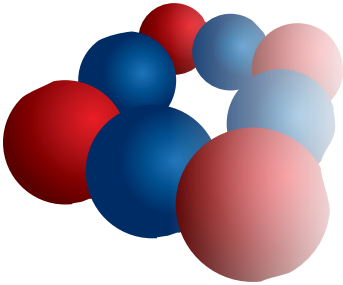
Medical students at the University of Massachusetts

MASSACHUSETTS

Medical School in Worcester (www.umassmed.edu) can participate in an international medical education program that includes service projects in countries such as South Africa, Costa Rica, Honduras, Bolivia, India, Nepal, Israel, and Ireland.

Find out how the 16 federal career clusters connect what you learn in the classroom to the real world.

All ABOUT Career Clusters



CAREER CLUSTERS are a way of organizing courses, electives, and extended learning experiences around groups of related occupations and industries, such as those in Health Science. Students in schools offering career clusters get to choose a cluster on the basis of their interests, strengths, and goals.

Within each cluster are pathways or programs of study—similar to college majors. For example, the national Health Science career cluster includes five programs of study (your state or school may have different ones): Biotechnology Research & Development, Diagnostic Services, Health Informatics, Support Services, and Therapeutic Services. The courses and electives offered in each pathway help students gain the knowledge and skills needed to enter a challenging Health Science college program or career after high school.

The United States Department of Education has designated these 16 federal career clusters:

■ Agriculture, Food & Natural Resources	■ Hospitality & Tourism
■ Architecture & Construction	■ Human Services
■ Arts, A/V Technology & Communications	■ Information Technology
■ Business Management & Administration	■ Law, Public Safety, Corrections & Security
■ Education & Training	■ Manufacturing
■ Finance	■ Marketing
■ Government & Public Administration	■ Science, Technology, Engineering & Mathematics
■ Health Science	■ Transportation, Distribution & Logistics

Individual states and school districts may offer all or some of these clusters to students. In some communities, career clusters are part of career academies or technical schools. Other districts make career clusters available to all students to better prepare them for their postsecondary education and careers.

If a formal career cluster system isn't in place in your school, ask your guidance counselor if another school in your district offers the Health Science career cluster or a more focused Health Science career and technical education (CTE) program. In many districts, academic transfers to an out-of-zone school are available to students who cannot get the courses they need locally.

Even if career clusters aren't available in your area, you can still use the Health Science career cluster as a guide for choosing the most rigorous and relevant Health Science-related courses and electives at your school.

For more information on career clusters, visit www.careerclusters.org.



The bachelor of science program in bioinformatics

MICHIGAN

at Michigan Technological University (www.mtu.edu) in Houghton requires cooperative work experience. During their co-ops, juniors work in selected biotechnology, pharmaceutical, and bioinformatics companies.



Graduates of the physical therapist assistant

MINNESOTA

associate's degree program at the Anoka-Ramsey Community College (www.an.cc.mn.us) Coon Rapids campus are prepared for jobs assisting physical therapists in hospitals, clinics, home care, and outpatient facilities. Coursework physiology, kinesiology, and clinical practice.

MEET A HEALTH SCIENCE STUDENT

NAME: **Angela Li**

OCCUPATION: Research Lab Assistant at Kennedy Krieger Institute, Baltimore, Maryland

EDUCATION: Bachelor of Science Degree in Molecular and Cellular Biology, Johns Hopkins University, Baltimore

ANGELA LI'S JOB TITLE, lab assistant, might not sound impressive, but the work the 22-year-old does each day is detailed and complex, and has tremendous value in cancer research. As a research lab assistant, Li performs experiments to better understand the biology of cancer, putting her on the forefront of trying to cure the deadly disease.

"I love that the results from my job can so directly have an impact on the landscape of medicine today," Li says. "Our benchmark research has incredible potential to translate into bedside treatment for cancer patients. In many ways, it is also the most challenging part of my job, as making novel discoveries in science also means much uncertainty and endless trial and error."

Taking the most challenging math and science classes at Whippany Park High School in Whippany, New Jersey, helped Li prepare for her current research job, as well as helped her gain admission to several top universities. She encourages students who are considering a career in any Health Science field to take any advanced placement (AP) math and science courses available at their schools, and to seek out career-related volunteer opportunities to learn more about specific jobs.

"With all the free time I had in high school compared to college," she says, "I wish I had spent more time doing volunteer work in either a hospital setting or a research lab. These experiences would have given me earlier exposure to both the clinical and the research aspects of medicine. I became interested in medicine during high school, due to my science classes and an opportunity I had to attend a mini-medical program my junior year."

In addition to earning solid grades in math and science college courses, Li says another important skill for any future Health Science professional is time management. People in health-related careers typically work long hours, have varied shifts each week, and are often "on call," meaning they need to be available to work, consult, or conduct research at any hour of the day. Li's undergraduate schedule combined classes, community service, work, study time, and activities, which helped prepare her for the demands of a Health Science job.

"For me, a typical day at college included attending class, after which I would volunteer at the downtown resource center or take the shuttle to the medical campus for research," she recalls. "Some days, I would come back to attend another class in the late afternoon. Evenings were spent at extracurricular activity meetings, so I didn't get to start work on homework or studying until about 9 p.m."



INSIDE SCOOP:
"Students should visit the colleges they have been accepted to before making a decision. It's easy to choose a college based on prestige, but brand-name schools will mean nothing if students end up hating the atmosphere there. After learning of all my acceptances, I went to visit my top three choices, and found that I felt most at home and at ease at Johns Hopkins. Now that I've graduated, I stand by my decision. I truly enjoyed my college experience."

— ANGELA LI



The two-year respiratory care technology program at

MISSISSIPPI

the Jackson County campus of Mississippi Gulf Coast Community College (www.mgccc.edu) prepares students to become respiratory care practitioners responsible for performing cardiopulmonary resuscitation; setting up and monitoring life support systems; and administering inhalation treatments, oxygen, and drugs.



Health Science *Education*

Explore how to move from high school into a successful Health Science career. Here is a look at ideas and issues to keep in mind as you pursue the education you need to break into Health Science.

TRY BEING AN EMT Volunteering or working as an emergency medical technician (EMT) while in high school and college is a great way to get hands-on Health Science experience and figure out if you're a good fit for a health care career. In addition, if you think you might like to become a paramedic, nurse, doctor, physical therapist, or dentist, or want to enter another competitive health field, having real EMT experience can give you an edge over other college and job applicants. Being an EMT is also a great way to earn money for tuition, books, and food.



The job title EMT-Basic refers to the first responder of the emergency medical system. An EMT trained at this level is prepared to care for patients at the scene of an accident and while transporting them by ambulance to the hospital under the direction of more highly trained medical personnel. The EMT-Basic has the emergency skills to assess a patient's condition and manage respiratory, cardiac, and trauma emergencies.

EMT-Basic training, certification, and employment guidelines vary from state to state, so check with your state's Department of Health to see when and how you can get training. Some states allow students as young as 16 to become ride-along EMTs (you can't treat patients, but you can assist). The more common minimum age for EMT-Basic certification, however, is 18. For a description of this career, see page 19 or go online to the Occupational Outlook Handbook at www.bls.gov/oco/ocos101.htm.

WHY GRADES REALLY DO MATTER

Grades are a fact of life. In general, when it comes to Health Science, the higher your GPA (grade point average), the more opportunities you will have for education and careers after high school. It's even better if those grades were earned in challenging courses, such as advanced placement and honors-level math, science, and English classes (see sample schedule). If you take the easiest courses and do the minimum required to graduate, then your diploma won't be worth much. To get the biggest return from your investment in high school, treat school like your job. Think of what it takes to succeed at work, and then apply those same skills to the classroom. Follow the six tips below to boost your GPA and position yourself to be admitted to college and earn scholarships.

- SIX JOB AND SCHOOL SUCCESS TIPS**
1. Be on time to every class. The first thing employers want is punctuality.
 2. Make sure all of your assignments are turned in neat, complete, and on time.
 3. Pay attention in class. In school and on the job, focus matters.
 4. Ask questions and ask for help when you don't understand something.
 5. Contribute to class discussions. Collaboration is part of job success.
 6. Make time each day for homework and studying. Treat school like a job.



STAND OUT ON STANDARDIZED TESTS

Most colleges use standardized test scores to help make admissions decisions. In general, they require scores from either the SAT or the ACT. Both tests are offered several times a year. Register online for the SAT at www.collegeboard.com and for the ACT at www.actstudent.org. To be safe, before you take any standardized test, practice, practice, and practice.

HEALTH SCIENCE SCHEDULE: SAMPLE CLASSES TO TAKE AT EACH GRADE LEVEL



Wherever you are in your high school or college career, there are things you can do to build your Health Science skills, knowledge, and experience. Of course it helps to begin sooner, but it's never too late to start learning.

At right is a sample four-year class schedule for a student who wants to prepare for a Health Science college program or career after high school. Don't worry if your school doesn't offer all the courses listed here. These are only examples based on what is typically available at a public high school.

Create your own four-year plan—or better yet, plan for the next six years—based on this sample, using your school's course offerings as a starting point. The goal is to build the strongest Health Science foundation possible by taking a math and a science class each year.

Ask your guidance counselor, teachers, and parents for help in identifying additional learning opportunities available online or in the community to supplement your Health Science education.

COURSES THAT MAY BE REQUIRED

- Computer Applications
- Fine Arts ■ Foreign Language
- Health ■ Physical Education

SUGGESTED ADVANCED PLACEMENT COURSES (IF AVAILABLE)

- Biology ■ Chemistry
- Psychology ■ Statistics

SAMPLE HEALTH SCIENCE STUDENT FOUR-YEAR PLAN

NAME: Logan Jones | SCHOOL: East High School | CAREER GOAL: Registered nurse
POSTSECONDARY GOAL: Bachelor of science degree in nursing

	MATH	ENGLISH	SCIENCE	SOCIAL STUDIES
9th Grade	Algebra I	English I	Biology or Physical Science	World History or Geography
10th Grade	Geometry	English II	Chemistry or Biology	U.S. History or World History
11th Grade	Algebra II with Trigonometry	English III	Physics or Chemistry	Government/Economics or U.S. History
12th Grade	Pre-calculus or Calculus	English IV	Engineering or Physics	European or Art History

SAMPLE CAREER AND TECHNICAL HEALTH SCIENCE-RELATED COURSES

- Health Science Technology
- Medical Terminology
- Foundations of Health Science
- Emergency Services
- Health Promotion and Wellness
- Introduction to Pharmacy
- Dental Assisting
- Therapeutic Services
- Human Body Structures and Functions
- Sports Medicine
- Diagnostic Services
- Introduction to Biotechnology



The University of Missouri School of Health Professions

MISSOURI

(shp.missouri.edu) SHaRP Scholars Program in Columbia offers guaranteed admission into the school's professional programs for selected high school seniors with a composite ACT score of at least 30 who also rank in the top 10 percent of their high school class.



Health and human performance majors at

MONTANA

Montana State University (www.montana.edu) in Bozeman can choose the kinesiology option to prepare for careers in organizing, directing, and managing fitness and wellness programs in corporate and commercial settings.

Which Health Science career is best for you? You'll never know until you try some out.

Finding *Your* Place

BEFORE YOU INVEST your time and money in a Health Science certificate or degree program, get some valuable hands-on experience to figure out what you like and don't like. Even if you've always dreamed of being an athletic trainer,



for example, you won't know what it means to work day-to-day in that career unless you get some real-world experience as a student volunteer, intern, or part-time employee.

when Aaron Smith (see photo) graduated from high school, his plan was to become a pharmacist. While at Carson-Newman College in Jefferson City, Tennessee, Smith also worked part-time as a certified pharmacy technician. Soon, he found that wasn't the right choice for him.

"I want to do something that is more hands-on

than filling prescriptions," Smith says. "Then I learned about the nursing program at Tennessee Wesleyan College in Athens, Tennessee. I started researching nursing, and realized that was a better match for me."

Smith believes that some health-related work or volunteer experiences in high school would have saved him from a four-year detour to earn an undergraduate biology degree. He encourages students to list the Health Science careers that interest them, and then ask their parents, teachers, and counselors to help set up job shadowing experiences, internships, or part-time jobs.

Today, Smith is completing his nursing degree and getting real-world experience at a Knoxville hospital. He knows his career will include additional education and training.

"Once you become a nurse, you can go as far as you want by continuing to learn," he says. "Being a registered nurse is the starting point. You can become a nurse practitioner or a nurse anesthetist, for example. You can earn bonuses, extra pay, and money for your tuition."

JOINING A CTSO CTSOs (career and technical student organizations) give students who are interested in specific industries and occupations opportunities to build skills and knowledge related to their chosen field, to meet other students who share their interests, and to connect with career mentors, employers, and other professionals. Most public school districts offer these CTSOs related to the Health Science career cluster.

Health Occupations Students of America (HOSA), www.hosa.org
HOSA's mission is to enhance the delivery of compassionate, high-quality health care by providing opportunities for knowledge, skill, and leadership development among all Health Science technology students. Students network with peers and health care professionals at local, state, and national events; test their skills in HOSA competitions; and are eligible to apply for numerous scholarships.

SkillsUSA, www.skillsusa.org
This association for students in technical, skilled, and service careers (including health care) develops academic and technical skills, while encouraging members to become better citizens. Competitions assess higher-order thinking skills such as problem-solving, synthesis, and critical and reflective thinking. Through service projects, students build playgrounds, parks, and other structures that benefit their communities.

Student trainers in the highly competitive athletic

NEBRASKA

training education program at the University of Nebraska-Lincoln (www.unl.edu) gain valuable real-world experience working for three years with the Division I Huskers sports teams. Graduates are prepared to earn national certification as athletic trainers (see page 16).



STATE BY STATE

Through coursework and internships, the

NEVADA

undergraduate program in health care administration and policy at the University of Nevada, Las Vegas (www.unlv.edu) gives students a broad view of the health care delivery system. Students are prepared for graduate school or jobs in health organizations.

MEET A HEALTH SCIENCE STUDENT

NAME: **Felicia Udoji**

OCCUPATION: Doctor of Pharmacy

EDUCATION: University of Tennessee Health Science Center, Memphis

FELICIA UDOJI COULD HAVE graduated from Tennessee State University in Nashville in only three years thanks to the advanced placement and international baccalaureate credits she earned while a student at the city's Hillsboro Comprehensive High School/International Baccalaureate World School. But Udoji understood that by taking the most challenging undergraduate college courses, she would have more options and more potential for future success in a highly competitive Health Science graduate program. So Udoji chose to double major in molecular biology and cell biology and minor in psychology.

"As an undergraduate, I enjoyed both my biology and chemistry courses," Udoji says. "I double majored because I felt that knowledge of both subjects would enable me to be a better health professional. One should never double major on a whim; one must have an end goal in mind."

In addition to carrying a heavy course load, Udoji spent time in college exploring health careers through research projects, jobs, and internships. This included participating in pharmacology research at Vanderbilt University in Nashville and earning her pharmacy technician certification (CPhT). By her senior year, Udoji says she knew that pharmacy was for her.

As an African American, Udoji says she understands that it can be daunting for some students from minority communities to consider health care. "The truth is, there are not many African Americans in this field," she explains. "While African Americans account for 13 percent of the United States' population, only 4.4 percent of the nation's medical doctors are African American."

Instead of being discouraged, however, Udoji encourages students from underrepresented minority groups to change the face of Health Science through their hard work, determination, and achievements.

"Negative statistics are not an excuse to underachieve and not do your best," she adds. "If you choose not to pursue your dreams, you are doing yourself and other African Americans a disservice. My advice—and challenge—to those who don't have positive role models is to be your own role model and focus on your goals. I believe that the only barriers to your achievement are the limitations that you set for yourself."

"In the words of Gandhi, 'You must be the change that you wish to see in the world.' In addition, always work hard. At the end of the day, people will remember you only for the good things that you achieved. And, if you achieved nothing good, they will have nothing good to remember."



STATE BY STATE

Manchester Community College (www.manchestercommunitycollege.edu)

NEW HAMPSHIRE

offers allied health programs such as the two-semester medical coding certificate. It teaches students to take information from patient records and combine it with reimbursement and coding guidelines to optimize physicians' payments. Graduates are prepared to take the national certified coding specialist exam.

Learn how creating a plan and a portfolio will help you get ready for college and career.

Track *Your* Health Science Education



The Cooper University
Hospital School of

NEW JERSEY

Cardiovascular Perfusion (www.cooperhealth.org) in Camden offers programs to prepare graduates to use heart-lung machines and other life-supporting technologies that support patient health during heart surgery and other medical procedures.



About 80 applicants are selected each year for

NEW MEXICO

the University of New Mexico–New Mexico State University Cooperative Pharmacy Program (hsc.unm.edu/pharmacy/UNMNMSUcoop.shtml). It is designed to increase the number of pharmacy students from southern New Mexico. Students get scholarships for up to seven years of study.

PLAN FOR SUCCESS Many states and school districts require students to create formal individual education plans in eighth or ninth grade. Even if it's not required where you live, it's smart to make a six-year plan (four years of high school plus two of postsecondary education) so that you can take control of your education and career choices. If your Health Science career goals include earning a professional degree—such as that required to become a pharmacist, physical therapist, or physician—you may want to create an even longer plan mapping your intentions for undergraduate school and beyond. Regardless of the years covered, include in your plan:

- **Your chosen career cluster** (if available at your school) and program of study (see page 24). Students interested in a health care career would choose the Health Science cluster, or create a plan focused on Health Science–related courses such as math and science.
- **Your postsecondary goal**, or what you plan to do after high school, such as a list of the colleges to which you want to apply. This objective will influence the classes you take in high school. If you want to attend a four-year nursing program, for example, you'll need certain math and science courses to gain admission. Other goals include joining the military (where you can earn a tuition-free nursing or medical degree in return for your service), attending a technical school or community college to earn a professional certificate or associate's degree, or completing an apprenticeship or on-the-job-training program.

HEALTH SCIENCE SKILLS TEN THINGS YOU NEED TO SUCCEED

The Health Science field is booming, with career opportunities at every education and salary level. Whether you plan to head directly to work through an on-the-job Health Science training program or dream of attending medical school, you'll need to graduate from high school with these essential skills and qualities to achieve your goals.

1. Strong math and science skills
2. Strong verbal and written communication skills
3. Strong teamwork skills
4. Time management and organizational skills
5. The ability to make quick decisions under pressure
6. A desire to make a difference in the lives of others
7. The ability to follow detailed directions and make precise measurements
8. Leadership skills, including the ability to delegate
9. Experience in a lab, hospital, or other Health Science setting
10. The energy and perseverance to work long hours

- **Your class schedule for all four years.** A lot of your schedule will be filled with required courses, but there will be chances for you to add in career-related electives that will help you achieve your goals.
- **Extended learning activities** that expand your knowledge, skills, and experience. Examples are career and technical student organizations (see page 28), volunteering, internships, job shadowing, mentoring, and summer and part-time jobs.

Once you have your plan, revisit, review, and update it each year. Changing your plan as your goals change is better than having no plan at all.

CREATE A CAREER PORTFOLIO

A career portfolio is like a file folder in which you store all your high school achievements, honors, work experiences, grades and transcripts, employer and teacher recommendations, and best work (such as papers and tests for which you earned top grades). The information stored in this locker will come in handy when you apply to colleges and for internships and jobs.

If you have access to a computer, save or scan items that show your talents and achievements into a “career portfolio” folder. You can then print out all or part of the portfolio as needed, or e-mail the file as part of an application. A paper portfolio works almost as well, so don't worry if you don't have the capacity to store everything electronically. Label every item in your portfolio with key dates and a description. This will help you answer questions on college applications and in interviews.

MEET A HEALTH SCIENCE STUDENT

NAME: **Nicole Alessi**

OCCUPATION: Staff Nurse at Presbyterian Hospital/Weill Cornell Medical Center, New York, New York

EDUCATION: Bachelor of Science Degree in Nursing, Hartwick College, Oneonta, New York

AFTER SHE GRADUATED WITH a bachelor's degree in nursing from Hartwick College in Oneonta, New York, Nicole Alessi, a native of Maine, wanted to move to New York City to experience urban life for the first time. Since it can be expensive to live in the Big Apple, Alessi knew she would have to land a job at a top hospital to be able to afford her new hometown.

“I spent the summer after college interviewing for nursing jobs, studying to take the NCLEX (National Council Licensure Examination for nurses), and working long hours as a waitress to be able to afford the move,” Alessi says. “That fall, I passed the NCLEX, got a job offer from Presbyterian Hospital/Weill Cornell Medical Center, and found an apartment in Manhattan within walking distance of the hospital.”

Three years later, Alessi is still working at the same medical center, but has moved across the Hudson River to Hoboken, New Jersey, to make living in the New York metro area more affordable. She enjoys the diversity of city life, including the limitless arts, cultural, entertainment, dining, and shopping options. Earning a steady, generous income as a staff nurse in the mother-and-baby unit provides the funds Alessi needs to pay for rent and food, while having cash left over for fun and savings.

“Being a nurse helped me get a job in the city,” she explains. “There is a nursing shortage, which makes nursing a great career choice, plus the large hospitals in New York are able to hire more new graduate nurses.”

Alessi's job involves caring for mothers and their babies once they leave the labor and delivery unit. She especially enjoys helping new parents build the confidence needed to feel comfortable taking their infants home. “I assist with postoperative care, administer pain medications, and make sure the mothers are recovering well,” Alessi explains. “If there is a problem, I serve as a liaison between the patient and the doctor. I also care for the newborn infants, teach the parents about baby care—including changing diapers, bathing the baby, breastfeeding, and formula feeding—and answer the parents' questions.”

Although Alessi loves being a nurse, she admits that when she graduated from York (Maine) High School, she had no idea what major she wanted to study in college. To start figuring out her own future path, Alessi asked her college classmates about their majors and future goals. Talking to the nursing majors inspired her to research the profession and choose a health care major.

“I knew I wanted a job where I was able to help others and make a difference,” she explains. “I also knew that I wanted a hands-on, active career. Once I started learning more about nursing, I realized it was a perfect fit for me.”



Students in the emergency
medical technician—

NEW YORK

paramedic associate in applied science program at Dutchess Community College (www.sunydutchess.edu) in Poughkeepsie develop advanced life support skills in on-campus laboratories, local hospitals, and ambulances. Graduates have the skills to assess, triage, and treat multiple patients simultaneously.



Plan for more school because almost every Health Science profession requires a two- or four-year college degree or another type of postsecondary education or training.

Health Science *After* High School



PHYSICIAN— OR PHYSICIAN ASSISTANT?
You don't have to become a doctor to be a primary health care provider. For example, physician assistants (PAs) are health professionals licensed to practice medicine with physician supervision. One big plus: the time and money you invest in becoming a PA are less than what you would need to become a doctor, which requires a four-year undergraduate degree (generally with a major in pre-med), four years of medical school, and years of internship or residency, depending on specialty. With doctors in short supply in rural and urban areas, the demand for PAs is high. As one you can typically:

- Take medical histories
- Perform physical exams
- Order laboratory tests
- Diagnose and treat illnesses
- Counsel patients
- Promote wellness
- Assist in surgery

Learn more about what physician assistants do at the American Academy of Physician Assistants website, www.aapa.org.

HEALTH SCIENCE POSTSECONDARY OPTIONS

With a solid Health Science foundation in high school, you can move directly from graduation to postsecondary (after high school) education and training programs. But the learning doesn't stop there. Whatever career you choose, lifelong learning is needed to keep up with the latest research and treatment techniques, develop new skills, and advance to higher levels of salary and responsibility. Here is one example of how someone interested in physical therapy can progress from earning an entry-level certificate to the highest level of education available in his or her profession.



CAREER GOAL | PHYSICAL THERAPIST
POSTSECONDARY PROGRESSION (SHORTEST TO LONGEST)

- PHYSICAL THERAPY AIDE CAREER CERTIFICATE**
| **WHERE:** TWO-YEAR COMMUNITY OR TECHNICAL COLLEGE
- ASSOCIATE'S PHYSICAL THERAPY ASSISTANT DEGREE**
| **WHERE:** TWO-YEAR COMMUNITY AND TECHNICAL COLLEGE PROGRAM ACCREDITED BY THE COMMISSION ON ACCREDITATION IN PHYSICAL THERAPY EDUCATION (CAPTE)
- MILITARY/BACHELOR'S DEGREE IN A RELATED MAJOR, SUCH AS ANATOMY, BIOLOGY, BIOMECHANICS, OR CHEMISTRY, TO PREPARE FOR GRADUATE-LEVEL PHYSICAL THERAPY STUDY**
| **WHERE:** WHILE ON ACTIVE DUTY OR IN THE RESERVES
- BACHELOR'S DEGREE IN A RELATED MAJOR, SUCH AS ANATOMY, BIOLOGY, BIOMECHANICS, OR CHEMISTRY, TO PREPARE FOR GRADUATE-LEVEL PHYSICAL THERAPY STUDY**
| **WHERE:** FOUR-YEAR PUBLIC OR PRIVATE COLLEGE OR UNIVERSITY
- MASTER'S DEGREE IN PHYSICAL THERAPY***
| **WHERE:** PUBLIC OR PRIVATE COLLEGE OR UNIVERSITY *Minimum education required to become a licensed physical therapist
- DOCTORAL DEGREE IN PHYSICAL THERAPY**
| **WHERE:** PUBLIC OR PRIVATE COLLEGE OR UNIVERSITY
- CLINICAL RESIDENCY OR FELLOWSHIP**
| **WHERE:** MEDICAL CENTER OR SCHOOL OF MEDICINE



COLLEGE APPLICATION CHECKLIST

- College admissions can be overwhelming, especially if you are the first in your family to apply. Boost your chances of getting into a Health Science program by following these seven steps:
- 1. MAKE A LIST** Before you apply, decide what to study and what you want in a school (such as location, size, or religious affiliation). Research using online tools such as www.collegeboard.com.
 - 2. PLAN FOR TESTS** Most four-year colleges want scores from the ACT, SAT, or SAT II tests. Sign up to take them in time to include the scores in your application, and then practice the free SAT sample questions at www.collegeboard.com or ACT tests at www.actstudent.org.
 - 3. ASK FOR RECOMMENDATIONS** If your applications require a teacher, coach, or employer recommendation, be sure to give the people you ask plenty of time to complete the form. Thank each one with a personal note.
 - 4. MEET DEADLINES** Colleges take application and financial aid due dates seriously, and so should you. Being late may mean rejection or less aid. Create a calendar and a "to do" checklist and follow them.
 - 5. DO A DOUBLE-CHECK** Before you send in a college application, double-check your spelling, make sure nothing is missing, and save a copy just in case you have to submit it again. Check and double check.
 - 6. PAY THE APPLICATION FEE** College application fees can range from nothing to more than \$60. Some colleges waive them if you have financial need or if you apply online. Forgetting the fee can delay your application's review, so be sure to include payment or the proper waiver form when you apply.
 - 7. CHECK FOR UPDATES** Most schools give students access to a secure online website where they can check the status of their applications. Visit regularly to make sure you aren't missing any required documents. And check your or your parents' e-mail in case a college sends you a notice. Stay on top of the process.

TOP PHYSICIAN ASSISTANT PROGRAMS

- One hot career option in Health Science is physician assistant (see box above right), which generally requires a master's degree. Here are the top graduate schools for that profession, according to *U.S. News & World Report* college rankings (www.usnews.com/sections/education).
- University of Iowa, Iowa City, Iowa (www.uiowa.edu)
 - Duke University, Durham, North Carolina (www.duke.edu)
 - Emory University, Atlanta, Georgia (www.emory.edu)
 - George Washington University, Washington, D.C. (www.gwu.edu)
 - University of Texas Southwestern Medical Center at Dallas, Dallas, Texas (www.utsouthwestern.edu)
 - University of Utah, Salt Lake City, Utah (www.utah.edu)
 - University of Washington, Seattle, Washington (www.washington.edu)
 - University of Colorado-Denver, Aurora, Colorado (www.ucdenver.edu)
 - Baylor College of Medicine, Houston, Texas (www.bcm.edu)
 - Oregon Health and Sciences University, Portland, Oregon (www.ohsu.edu)
 - Interservice Physician Assistant Program, Fort Sam Houston, Texas (www.usarec.army.mil/armypa)
 - Stony Brook University/State University of New York, Stony Brook, New York (www.stonybrook.edu)
 - University of Texas Medical Branch at Galveston, Galveston, Texas (www.utmb.edu)
 - Quinnipiac University, Hamden, Connecticut (www.quinnipiac.edu)

STATE BY STATE

Undergraduate programs in the new Health and Applied

NORTH CAROLINA

Human Sciences school at the University of North Carolina at Wilmington (www.uncw.edu/hahs) focus on improving health and quality of life. Majors and minors include community health education, gerontology, and recreation therapy.

STATE BY STATE

Indians into Medicine (INMED) at the University

NORTH DAKOTA

of North Dakota School of Medicine & Health Sciences in Grand Forks (www.med.und.edu/inmed) helps American Indian students preparing for health careers.



The word on financial aid and other ways to afford your postsecondary Health Science schooling.

Paying for YOUR Health Science Education

CUTTING COLLEGE COSTS Getting the education you need to prepare for a high-skill Health Science career is affordable if you know where to look. There are lots of sources of financial aid, as well as plenty of education options that can replace paying for four years of study at an expensive school. Consider these opportunities for getting the help you need to continue your Health Science studies after high school:



EARN COLLEGE CREDIT IN HIGH SCHOOL Many school districts allow high school juniors and seniors to take “dual-credit” college courses, which qualify for both high school and college credit. In addition, students can receive college credits for earning high scores on advanced placement exams or, in some cases, for attending summer academic programs on college or university campuses or governors’ schools (see page 38). Earning college credit while still in high school may enable you to graduate a year early, potentially a huge savings in tuition, books, room and board, and other fees.

STAY CLOSE TO HOME By choosing a public college, university, or technical school in your home state, you can save thousands of dollars each year in tuition costs. Even if you select a private school, attending one within a few hours’ drive of home will cut transportation costs (and make it easier to head home to do laundry, stock up on supplies, and participate in family events). Many states offer scholarship funds to high-achieving students who choose an in-state school. Visit your state’s Department of Education website to learn more.

START AT A COMMUNITY COLLEGE Most Health Science majors require basic or core courses the first two years, followed by specialized coursework in the junior and senior years and graduate school. You can save a considerable amount of money by taking those core courses at a local community college for the two years after high school. And if you also live at home and work part-time while you’re in school, you can save even more cash to use to transfer to the four-year college of your choice after earning your associate’s degree. In addition, if you weren’t exactly a straight-A student in high school, working hard and getting good grades at a community college can boost your GPA and your chances for admission at a top college.

HEALTH SCIENCE SCHOLARSHIPS A little time spent researching Health Science scholarship opportunities could result in some serious cash for college. The first place to look is on the financial aid websites of the schools where you would like to apply. See if any special scholarships are available for students interested in health care careers. Although many college grants are awarded as part of a financial aid package, others require separate scholarship applications.

Beyond your list of colleges, check out the scholarships available from state and national Health Science–related organizations, associations, websites, and government agencies, including the National Health Service Corps (nhsc.hrsa.gov) and www.DiscoverNursing.com.

In addition, register online at FastWeb (www.fastweb.com), a free college scholarship search source listing more than \$3.4 billion in financial aid funds.



FAFSA: THE KEY TO FINANCIAL AID Before you can receive any financial aid from a two- or four-year school, you need to fill out the Free Application for Federal Student Aid (FAFSA). Your parents or guardians need to help you complete this form as soon as possible after January 1 of the year in which you’ll be starting college. Don’t try to complete the FAFSA without their assistance, because they’ll need to supply salary, tax, and other financial information for the form to be processed. Even if you or your parents think your family earns too much to qualify for aid, you should *fill out the FAFSA anyway*. In addition to determining eligibility for federal aid, such as work-study, Pell grants, and low-interest federal student loans, the FAFSA may be used to determine college grants and even merit-based aid. Complete the form online at www.fafsa.ed.gov.

Most private schools also require you to complete a school financial aid application, as well as the CSS/Financial Aid Profile form (profileonline.collegeboard.com). Check with each school to which you are applying to find out what forms it requires. Often schools will request copies of completed tax returns from you and your parents, and the schools may give you the chance to explain and document special circumstances that have an impact on your family’s ability to pay for college, such as job loss or high health care expenses.



EARNING EDUCATION AND SKILLS THROUGH THE MILITARY Enlisting for active duty in the U.S. Army, Air Force, Navy, Marines, Coast Guard, National Guard, Air National Guard, or

Reserves is a way for high school graduates to earn pay, benefits, and full or partial college tuition in certain Health Science–related majors.

In addition, high-achieving students admitted to one of the nation’s five service academies—Merchant Marine, Military (West Point), Naval, Coast Guard, and Air Force—receive free tuition and a monthly salary while in school, and graduate as commissioned officers. The service academy selection process is highly competitive, with a nomination from the student’s congressional representative required as part of the application. College students can get up to a full four-

year scholarship plus an annual stipend by serving in their school’s Reserve Officers’ Training Corps (ROTC). Service members and veterans can also receive financial support for undergraduate and graduate degrees, vocational/technical training, and housing through the Post-9/11 GI Bill.

In exchange for free or reduced-cost education and benefits, enlisted personnel, officers, and National Guard and Reserve members serve in the military for a specified number of years. Individual commitments can vary from three years to more than eight years, depending on a variety of factors, including the amount of scholarship money earned. To learn more about the wide range of educational and training opportunities available through the military, talk to your school counselor and check out these websites:

- U.S. Army: www.goarmy.com
- U.S. Navy: www.navy.com
- U.S. Marines Corps: www.marines.com
- U.S. Air Force: www.airforce.com
- U.S. Coast Guard: www.gocoastguard.com
- U.S. Merchant Marine Academy: www.usmma.edu
- National Guard: www.nationalguard.com

Community nutrition majors at Oklahoma State

OKLAHOMA

University (ches.okstate.edu/) in Stillwater can choose the nutritional sciences–nutrition and exercise option. Courses in how nutrition affects the human body, personal health, and exercise prepare graduates for nutrition and health/wellness–related fields.



University of Oregon in Eugene students can become

OREGON

peer health education interns (health.ed.uoregon.edu/peerdetail.htm) who earn credits for giving health information to other young people.



STATE BY STATE

The University of Toledo’s recreational therapy (RT)

OHIO

program (www.utoledo.edu/hshs) is the only accredited RT program in the state. Graduates help people with disabilities in a variety of settings, including hospitals, clinics, camps, long-term care facilities, alcohol and drug treatment facilities, mental health centers, and group homes.

Get a firsthand look at the Health Science programs available at two- and four-year schools by talking to students who go there and taking campus tours.

Choosing a School

INVOLVE YOUR PARENTS IN THE SEARCH Your parents or guardians want you to graduate with the skills, knowledge, and focus you need to become an independent adult. Including them in the career exploration and college search process benefits all of you. Here's how:

- Your parents may have friends, neighbors, or work associates who are in Health Science careers or who graduated from a Health Science-related postsecondary program. By letting them know you are interested in the Health Science field, you may find they are able to help arrange job shadowing, mentoring, or internship opportunities for you to explore different careers.
- You want your parents to take you seriously and recognize that you aren't a kid anymore. Talking to them about your goals beyond high school and creating a real plan to achieve those goals demonstrates that you are ready to take control of your life.
- You'll need your parents' help in the form of possible financial support, information for completing financial aid forms, permission form signatures if you are under 18, and so on. Involving them as part of the career exploration and college search process early on makes it easier to ask for and receive their help in meeting application deadlines or in paying tuition.
- You may not realize it now, but your parents have a lifetime of education and work experience. However far they went in school and whatever jobs they have had, they have valuable experience to share that can help you make more informed decisions. Let them tell you their stories, and really listen to their opinions. You may be surprised at what they have to teach you.

CHECKING OUT COLLEGES

Any college can look like the perfect fit when viewed on a website or in a glossy brochure. But to get the inside scoop on what a two- or four-year college is really like, you need to make a personal visit. Walk around the campus, talk with current Health Science students in the majors that interest you, and step inside Health Science classrooms and research facilities to help decide which school is right for you. Use the tips below to get the most out of every campus visit.

LOCATION Is the college located in an area—urban, suburban, rural—where you would feel comfortable living for two or more years? Are there stores and restaurants nearby? Would you need a car to get to a grocery store or movie theater?

REAL COSTS Any scholarships, loans, and grants you get for school will likely cover only tuition and room and board. Ask current students, faculty, and admissions staff about the real, total costs of attending the school, including special lab and equipment fees for Health Science majors. Add in food and transportation costs to figure out if you can realistically afford to attend the school for two to four years.

HEALTH OPTIONS You may want to become an athletic trainer for a professional football team now, but what if you get to college and discover a new Health Science career you hadn't considered before? Find out how hard it is to switch majors. Are there lots of majors available, or will you be limited to a few choices?

EXTRA HELP Everyone needs a little help now and then. That's particularly true in many Health Science majors, in which challenging math and science courses are part of the program. Does the school offer tutoring or extra help sessions?

TAKE NOTES All the colleges you see will start to blur together into one big, confusing memory. By taking notes at each school—on paper, your laptop, video, or a smart phone—you will find it easier to remember and review the pros and cons of each campus later on.

GUT CHECK Finally, how do you feel when you walk around the campus? Could you see yourself there? Do the current students you meet seem like people you would like to get to know? Are they welcoming and positive about their school? You don't want to spend two years, four years, or more miserable and regretting your choice, so trust your instincts to help you decide.

MEET A HEALTH SCIENCE STUDENT

NAME: **Jorge Malouf**

OCCUPATION: General Manager, Malouf Chiropractic Center, Silver Spring, Maryland

EDUCATION: Bachelor of Science Degree in Molecular and Cellular Biology, Johns Hopkins University, Baltimore

A T ONLY 22 YEARS OLD, Jorge Malouf serves as the general manager of his family's thriving chiropractic centers located in Silver Spring, Maryland, and Falls Church, Virginia. In addition to communicating with customers and insurance companies, Malouf coordinates billing for hundreds of patient accounts. This real-world experience, combined with an undergraduate degree from Johns Hopkins University in Baltimore, has helped Malouf build the skills and knowledge needed to apply to medical school.

The Guatemalan-born Malouf says he's dreamed of becoming a doctor for as long as he can remember; it was a goal instilled, in part, by the fact that both of his parents are nurses. That dream was nearly derailed in college, however, when Malouf's mother was diagnosed with breast cancer and he was told he had an incurable health condition—a tennis ball-sized cyst in his brain. The cyst causes severe headaches.

"There was a breaking point in college where I struggled," Malouf recalls. "I had a lot going on at home, college was difficult, and the stress and frustration of my headaches made it all even harder."

Malouf's determination kept him going. He worked at the chiropractic center to help his parents, commuted more than two hours each day to campus, and earned his degree two years after his mother won her battle with breast cancer. He's working on his medical school applications and hopes to begin his professional training in the fall of 2011.

"By the end of my college career, I realized that medicine is not just what I want to do forever, but it is a field in which I can bring a lot of personal experience to the table. Being there for someone else when they need help the most, when their life is in jeopardy, is why I want to be a doctor—and why I will become a doctor—one day."

For others who share a similar goal, Malouf says it's important to get firsthand experience in a medical setting via a job, an internship, or job shadowing.

"In my job at the chiropractic center, I get to see patients who talk about feeling better after their treatment, which is so rewarding," he adds. "Some people had lost hope for years that they would ever get better. To see them leaving with a smile on their faces is what keeps me coming back to work day after day."

Although Malouf's personal and family health issues made his college career more difficult at times, he says that every pre-med student needs a steady supply of doggedness plus some stress relief. "Pushing yourself to the limit will burn you out, so take short breaks after every hour you study," Malouf advises. "But never stop believing in yourself, never lose focus on your goal, and never give up without a fight."



STATE BY STATE

The 12-month medical coding certificate program at

PENNSYLVANIA

Pittsburgh Technical Institute in Oakdale (www.pti.edu/programs/medical-coding.html) teaches students how to translate verbal descriptions of diseases, injuries, and procedures into codes. Graduates are prepared to take the national coding exam, and then start working as medical coding specialists.



STATE BY STATE

The University of Rhode Island in Kingston offers a

RHODE ISLAND

pharmaceutical sciences program (www.uri.edu/pharmacy/programs) to prepare students for careers in the pharmaceutical, consumer products, and health care industries. Graduates aren't pharmacists, yet are qualified for careers in research and development, manufacturing, and product marketing.

Check out these Health Science extended learning experiences through which you can explore careers, build skills, and discover whether the field is right for you.

Health Science for *Fun*



MEDICAL SCHOOL AND HOSPITAL SUMMER CAMPS

Numerous medical schools and hospitals nationwide sponsor both day and residential summer camps for high school students interested in learning more about health careers. One such program, the Health Careers Institute at Dartmouth (tdi.dartmouth.edu/hcid) in Lebanon, New Hampshire, is a one-week residential career exploration camp hosted by Dartmouth Medical School, Dartmouth-Hitchcock Medical Center,

and local health care professionals. Rising 10th-grade, 11th-grade, and 12th-grade students get hands-on experience in real-world medical settings, participate in team projects, interact with a variety of health professionals, and work with simulated patients. Reduced tuition and scholarships are available for New Hampshire residents.

GOVERNORS' SCHOOLS Several states sponsor free four- to six-week residential summer Governor's School programs for rising high school juniors and seniors. Students are selected on the basis of grades, standardized test scores, personal essays, and recommendations, and participants can often earn college credits for Governor's School coursework. The schools are typically held on college campuses and include career exploration and recreational field trips. Some states also offer tuition-free, academic-year residential or "virtual" Governor's Schools in focused subject areas. For example, Virginia's Blue Ridge Virtual Governor's School (BRVGS) provides a challenging math, science, and technology curriculum for students interested in Health Science; Science, Technology, Engineering & Mathematics (STEM); or Information Technology. The program uses interactive technology, field trips, student collaboration, and team teaching to create and connect a regional community of learners from Virginia's Fluvanna, Goochland, Greene, Louisa, Madison, Nelson, and Orange counties. To learn more about the free summer and academic-year Governor's School opportunities in your state, talk to your school counselor or visit your state's Department of Education website.



NATIONAL INSTITUTES OF HEALTH (NIH) INTERNSHIP

(www.training.nih.gov/programs/sip)

High school students who are at least 16 years old are eligible to apply for the highly competitive NIH summer program. Interns spend eight



weeks working side by side with some of the leading scientists in the world, in an environment devoted exclusively to biomedical research. Opportunities are available in the Mark O. Hatfield Clinical Research Center and on more than 1,200 laboratories/research projects located on the NIH main campus in Bethesda, Maryland, as well as in Baltimore and Frederick, Maryland; Research Triangle Park, North Carolina; Phoenix, Arizona; Hamilton, Montana; Framingham, Massachusetts; and Detroit, Michigan.

NURSING CAREERS SUMMER CAMP

(www.capitalahec.org/Summer%20Camp.html)

The Texas Capital Area Health Education Center (AHEC) sponsors two five-day summer camps for high school students interested in nursing careers. During both camps, students participate in hands-on health care activities and learn what they need to do to start preparing for a future in that field. Activities include hospital tours, job shadowing, and simulation labs. The camps are held at the University of Texas at Austin and Texas State University in San Marcos, and the \$50 fee covers all meals, lodging, and activities. Students in the Capital AHEC service region who are entering 10th, 11th, or 12th grade and who will turn 16 on or before the day that camp begins are eligible to attend.



WASHINGTON HEALTHCARE WEEK

(www.wbw.org/pages/HealthcareFlyer2010.pdf.pdf)

Washington Healthcare Week summer sessions are held on the campuses of Gonzaga University and Pacific Lutheran University in Washington state. The week-long leadership programs are designed to introduce high school students to the varied career possibilities available in the health care industry. High school students attend seminars and workshops, and work in a simulated "clinic" of 10 students paired with a mentor from the health care industry. Group activities are designed to build essential skills in teamwork, ethics, and leadership. Students from any state are encouraged to apply.



Students in the Public Health Sciences Department at

SOUTH CAROLINA

Clemson University's College of Health, Education and Human Development (www.clemson.edu/hehd) in Clemson can choose a health promotion & education concentration to prepare for a career as a health educator. Graduates are qualified to take the certified health education specialist (CHES) exam.



The Jackrabbit Guarantee at South Dakota State

SOUTH DAKOTA

University (www.sdstate.edu) in Brookings rewards first-time students earning 24 or higher on the ACT with a minimum \$1,000 scholarship per year for up to four years. SDSU offers numerous Health Science programs, including nursing, nutrition and food science, and health promotion.



Blount Memorial Hospital (www.blountmemorial.org)

TENNESSEE

in Maryville offers 11-month licensed practical nurse (LPN) training for high school graduates at least 18 years old. The curriculum prepares students to take the state LPN licensing exam.

UNIVERSITY OF PITTSBURGH HEALTH CARE SCHOLARS ACADEMY

(www.hcsa.pitt.edu/program.htm)

This four-week, residential program introduces rising high school juniors and seniors to the world of health care, emphasizing the health care delivery system, primary care, prevention, public health, career exploration, and healthy communities. To apply, students must have at least one custodial parent or court-appointed guardian whose primary residence of record is in Pennsylvania, or be a military dependent stationed in the state. All students are assigned to a concentration course to pursue one area of study in depth. The courses include family and child health, behavioral health, geriatrics, global health, and public health. Additional activities include two job shadowing days and multiple site visits to health-related laboratories, care centers, and other facilities.



NATIONAL AHEC (AREA HEALTH EDUCATION CENTERS) HEALTH CAREERS SUMMER PROGRAMS

The mission of the AHEC (Area Health Education Centers) program is to recruit, train, and retain a health professions workforce committed to underserved populations. There are 56 AHEC programs nationwide with more than 235 centers operating in almost every state and the



District of Columbia. Many AHEC affiliates sponsor programs similar to the South Carolina Area Health Education Consortium's Health Careers Summer Institute (www.scahec.net/hcp/hcp.html). The South Carolina program is an intensive, four-day residential educational experience for high school and undergraduate college students interested in a health professions career. The institute includes activities and interactive sessions on academic and career planning, resource development, and basic health skills training. Following this leadership institute, students participate in a five-week summer program. Specific sessions vary by region and may include academic enrichment workshops, college-level course instruction, internships in health care offices or facilities, or health professions training. For more information, contact your state or regional AHEC office (www.nationalahec.org).



The Cancer Therapy & Research Center at the

TEXAS

University of Texas Health Science Center in San Antonio (www.uthscsa.edu/shp/index.asp) offers a one-year, graduate-level Medical Dosimetry training certificate program. Medical dosimetrists work with medical physicists and radiation oncologists to compute the right dose of radiation to give a patient during radiation therapy.

HOSPITAL CAREER EXPLORATION OPPORTUNITIES

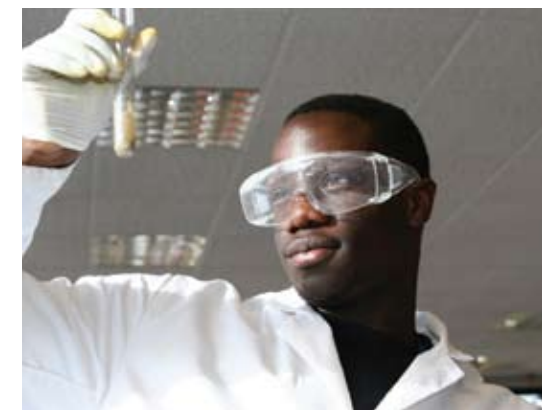
Many hospitals offer job shadowing, career exploration, or volunteer opportunities for high school students interested in health care careers. In Sioux Falls, South Dakota, Sanford Health (south.sanfordhealth.org/employment/healthcareexplorationforstudents), for example, hosts Sanford Scrubs Club, a free health career exploration program for local students in grades nine to 12. The academic-year component meets one evening a month for 90 minutes, September through April. The summer club is held over three consecutive days in June. Sanford also offers a virtual health care career exploration program in partnership with the South Dakota Office of Rural Health. The virtual program allows students to gain access to health career programming without leaving their classroom. Check with the community outreach coordinators at local hospitals to find out what job shadowing and career exploration programs are available to high school students in your area.



CONTINUING UMBRELLA OF RESEARCH EXPERIENCE (CURE) PROGRAM

(crchd.cancer.gov/students/hs-funding-opportunities.html)

The CURE program provides research training and academic and professional enrichment activities for highly motivated underserved students (high school and undergraduate) at National Cancer Institute (NCI)-designated comprehensive cancer centers nationwide. Underrepresented populations include African American, Hispanic, American Indian, and Pacific Islander students. CURE students work side by side with cancer center scientists on current, challenging research projects. During the 12-week program, students spend most of their time working on research under the guidance of a faculty mentor and a peer mentor. Successful applicants receive a stipend and are required to commit at least four hours per week (one afternoon) during the academic year and 40 hours per week during the summer to their research and program activities. Eligible students are encouraged to check with the NCI-designated comprehensive cancer center in their region (a list is posted at cancercenters.cancer.gov/cancer_centers/cancer-centers-names.html) to see if the CURE program is available.



MEDICAL SCIENCE CAMP

(www.rit.edu/academicaffairs/summer/programs.php?interest=academic-camps)

The Rochester (New York) Institute of Technology sponsors several bioscience summer camps for high school students entering grades nine or 10, including a medical science camp. Two sessions are offered, each with a different focus area. For example, the 2010 camps were "Infectious Diseases and Pandemic: Who's Winning the Germ Wars?" and "Systemic Diseases: So You Want to Be a Doctor?" Programs change each year, but students may have the opportunity to become CPR certified, learn how to conduct basic diagnostic and medical lab techniques, and meet practitioners in medicine, dentistry, physical therapy, occupational therapy, pharmacy, and ultrasound.



THE NATIONAL YOUTH LEADERSHIP FORUM ON MEDICINE (NYLF/MED)

(www.nylf.org/med/index.cfm)

The 10-day NYLF/MED program introduces highly motivated high school students to the world of medicine. Programs are hosted by top medical centers in cities including Atlanta, Boston, Chicago, Houston, Los Angeles, and San Francisco. Participants learn about the educational requirements of various medical careers; discuss the complex ethical and legal issues facing the medical profession; and explore topics such as global epidemics, cures for life-threatening diseases, and life as a medical resident with current physicians and patients. To apply, students must have at least a "B+" average and demonstrate an interest in pursuing a career in medicine.



AMERICAN INDIAN STUDENT HEALTH CAREERS CONFERENCE

(www.usd.edu/medical-school/additional-hcc-opportunity.cfm)

The American Indian Student Health Careers Conference sponsored by the University of South Dakota (USD) Sanford School of Medicine is open to American Indian high school students entering the 10th, 11th, or 12th grade. The first three days of the camp are devoted exclusively to American Indian health care issues and opportunities. The remainder of the week joins the USD Health Care Careers Camp, which is open to high school students from South Dakota, southwest Minnesota, northwest Iowa, and northeast Nebraska. Campers explore health careers through group activities that include medical demonstrations, field trips to area medical facilities, lab tours, and a dentistry/dental hygiene session. Scholarships and transportation are available.

Students in the two-semester surgical technology

UTAH

certificate program at Salt Lake Community College (www.slcc.edu/surgicaltech) gain real-world surgical experience through two clinical placements in hospital operating rooms, surgical centers, doctors' offices, labor and delivery rooms, or emergency departments.



Norwich University (www.norwich.edu) graduate

VERMONT

Ronald Holbrook uses his sports medicine bachelor of science degree knowledge and training as a U.S. Peace Corps community health volunteer in Malawi, Africa. The rural health center where Holbrook works serves about 12,000 people in 102 villages.



On Your Own

How much will it cost to live on your own? The table below shows what unmarried American women or men whose average age is just over 21 spend per year.

WOMEN

CATEGORY

MEN

\$4,832	SHELTER	\$4,575
\$3,132	FOOD AND BEVERAGES	\$3,580
\$2,367	EDUCATION	\$2,407
\$1,168	VEHICLE PURCHASES (NET OUTLAY)	\$1,328
\$1,064	GASOLINE AND MOTOR OIL	\$1,203
\$1,059	APPAREL AND SERVICES	\$611
\$976	PERSONAL INSURANCE AND PENSIONS	\$1,351
\$913	UTILITIES, FUELS, AND PUBLIC SERVICES	\$907
\$691	HOUSEHOLD FURNISHINGS AND EQUIPMENT	\$570
\$603	OTHER VEHICLE EXPENSES	\$855
\$440	PERSONAL CARE PRODUCTS AND SERVICES	\$136
\$385	PERSONAL TAXES	\$742
\$371	AUDIO/VISUAL EQUIPMENT AND SERVICES	\$604
\$353	PETS, TOYS, HOBBIES, ETC.	\$97
\$289	MISCELLANEOUS	\$327
\$262	FEES AND ADMISSIONS CHARGES	\$270
\$242	PUBLIC TRANSPORTATION	\$151
\$175	HEALTH INSURANCE	\$184
\$158	HOUSEHOLD OPERATIONS	\$123
\$151	CASH CONTRIBUTIONS TO CHARITIES OR INDIVIDUALS OR ORGANIZATIONS	\$291
\$144	MEDICAL SERVICES	\$51
\$128	HOUSEKEEPING SUPPLIES	\$145
\$107	MEDICATIONS	\$62
\$95	OTHER ENTERTAINMENT SUPPLIES, EQUIPMENT, AND SERVICES	\$131
\$50	READING MATERIALS	\$45
\$29	MEDICAL SUPPLIES	\$14

\$20,184 (\$9.70 *)

TOTAL ANNUAL EXPENDITURES

\$20,760 (\$9.98*)



STATE BY STATE

The Claude Moore Precious Time Pediatric Respite Care

VIRGINIA

Program at James Madison University (www.jmu.edu) in Harrisonburg provides junior nursing students with hands-on learning experiences. Students provide social support to local families of children with special needs through 14 hours of home visits each semester.



STATE BY STATE

Over the 30-year history of the University of Puget Sound

WASHINGTON

(www.pugetsound.edu) physical therapy program in Tacoma, 100 percent of graduates have passed the licensing exam and found employment within six months of graduation.

Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey 2007–2008.

* Hourly wage based on working 40 hours a week, 52 weeks a year. These are averages; actual expenses for your area may be much lower or higher.



Listen to what employers say about succeeding in Health Science.

Bosses Speak

“[My advice is to] look for a good boss and a good organization. Never look for salary or title. If you have a good organization with a good boss, the other issues will take care of themselves over time.”

—PETER BUTLER, president and CEO, Methodist Health Care System



“I have as one of my priorities to meet face-to-face with my employees. I have an internal blog, and I’m communicating through every channel I can find. My message to them is that we’re in a great industry. What

we do here, discovering new [drugs], is so important to the planet.”

—JOHN LECHLEITER, CEO, Eli Lilly

“We are very thorough in our screening practices—we only hire employees with at least one year of experience. We drug screen and background check each person. We check references on each person and work hard to ensure we have a great fit between our employee and our client. All of our workers are insured and bonded, also, for the protection of our clients.”

—SHELLY SUN, CEO, Bright Star Health Care

“It’s not very hard to decide if people are bright enough to fill a role, but if they don’t [fit into the company culture or have] the work ethic, they just won’t last here.”

—DELOS “TOBY” COSGROVE, CEO, Cleveland Clinic



“My style has been to hire the best-quality individuals and to give them the responsibility and authority to make a difference in the organization. It is important to recruit and retain people who have high integrity and an entrepreneurial spirit,

but it is also important that these people are team players. The health care systems in our country are so complex that they leave no room for a rogue or an individualistic manager. In health care, you’ve got to be able to work as a team.”

—DAVID L. BERND, CEO, Sentara Healthcare

“First of all, we select people in our recruitment process who are interested in improvement and making a contribution to their specialty and to the improvement of care delivery. We have a strong ethic around teamwork, academics, and improvement. We have incentives, both time and money. People get credit for a variety of improvement activities.... We work hard to ensure that we are not disincentivizing things that we as an organization highly value.”

—GARY S. KAPLAN, chairman and CEO, Virginia Mason Medical Center

“A key goal of career [development] programs is to increase the number of skilled health care workers from diverse backgrounds. Many patients feel more comfortable talking to someone who is culturally competent, demonstrates genuine interest in the patient as a human being, and has a commitment to providing equitable and quality care.”

—HENRYNE TOBIAS, Project Director, www.ExploreHealthCareers.org, American Dental Education Association

MEET A HEALTH SCIENCE STUDENT

NAME: **Ben Barbour**

OCCUPATION: Pediatric Oncology Registered Nurse at East Tennessee Children’s Hospital, Knoxville, Tennessee

EDUCATION: Bachelor of Science Degree in Nursing, University of Tennessee at Knoxville

BEN BARBOUR’S DREAM WAS always to be a doctor, but during his freshman year as a biochemistry major at the University of Tennessee—Knoxville, his younger brother was diagnosed with leukemia, a malignant cancer of the bone marrow and blood. To help with his brother’s care, Barbour put his college education on hold—and found a different dream career.

Barbour did return to school when his brother’s health improved. He changed his major, however, and his career goal because of what he learned while spending time at his brother’s bedside at East Tennessee Children’s Hospital (ETCH).

“Before staying with my brother at ETCH, I had no idea what being a nurse entailed,” Barbour says. “Everything that I knew about health care, I had learned from watching TV, and at that time, there were no shows about nurses. My brother was treated with intensive chemotherapy for about six months. During his treatment, I was amazed at how much of my brother’s care was managed by nurses.”

Seeing firsthand how important nurses were to the overall care of patients convinced Barbour to start looking into health care career options beyond becoming a physician. His research helped confirm that nursing was the career field that best fit his strengths, interests, and goals. Also, Barbour says he liked the fact that nurses have fewer on-call shifts than physicians.

“I thought that I might be able to devote more time to a family as a nurse than as a doctor,” he explains.

Barbour graduated from the University of Tennessee at Knoxville’s College of Nursing in 2009 with a bachelor’s degree in nursing. During his senior year in college, he started working at ETCH as a nurse’s assistant, and became a nurse there a month after graduation. In his job, Barbour evaluates patients, administers medications (including chemotherapy drugs), draws blood for lab work, and conducts a variety of nursing interventions, such as starting intravenous drips and changing bandages. Two of the most important aspects of his role are communicating important patient information to other members of the health care team and serving as an overall patient advocate.

Being a nurse isn’t easy, Barbour notes, but for students who want a job where they can help others every day, he says nursing is a field worth researching.

“Nursing can be very rewarding,” he says. “Yet it also can be very stressful being responsible for another human’s life for a 12-hour shift. For most families, having a sick child is one of the worst things that has ever happened, especially when the child has cancer. If I can bring my patients and their families some happiness while treating their condition, I have had a good day.”



The West Virginia University School of Pharmacy (www.hsc.wvu.edu)

WEST VIRGINIA

in Morgantown has been a leader in pharmacy education, research, and patient care for nearly 100 years. It is one of only 12 pharmacy schools in the U.S. affiliated with a comprehensive academic health center.



The communicative disorders undergraduate program at

WISCONSIN

the University of Wisconsin at Stevens Point (www.uwsp.edu) features clinical observation rooms that allow students to observe seniors and graduate students as they conduct therapy; an active student speech, language, and hearing association; and a comprehensive hearing aid dispensing program.

Take a look inside our mini-hospital to see some of the more unusual Health Science professions that help keep the wheels of health care turning 24/7. If you want to make a difference, there could be a career here for you.

Health Science at Work

MEDICAL ILLUSTRATOR

Professional artists with advanced education in the life sciences and visual communication use the latest graphic design tools to transform complex Health Science information into 3-D images that can be understood easily by the general public. Medical illustrations are used in education, research, patient care, and marketing.

BARIATRIC COORDINATOR

Bariatric surgery is the technical name for any surgical weight-loss procedure designed to help obese people lose 100 pounds or more. Bariatric coordinators are specially trained nurses who educate patients about the weight-loss process; lead patient support groups; and assist patients before, during, and after hospitalization.



ART THERAPIST

Art therapists are creative mental health professionals who use drawing, painting, sculpture, and other art forms to help improve the physical, mental, and emotional well-being of children and adults. Art therapy is used to treat anxiety, depression, and other mental and emotional problems and disorders.

CARDIOVASCULAR TECHNOLOGIST (CVT)

As key members of the cardiac catheterization and electrophysiology laboratory teams, CVTs use high-tech tools to help physicians diagnose and treat cardiovascular problems. Two-year training programs prepare CVTs for entry-level jobs, and additional education is available for specialization in electrophysiology and echocardiography.



MEDICAL PHYSICIST

Medical physicists are highly trained cancer treatment specialists who have a background in nuclear engineering or physics. They partner with physicians to design the most-effective course of radiation treatment for each patient, supervise the computerized planning and placement of the radiation beams, and monitor the performance of high-tech equipment.

DIAGNOSTIC MEDICAL SONOGRAPHER

Certificate, associate's, and bachelor's degree programs prepare sonographers to create images of the body needed to assist in diagnosis. Sonographers use and maintain sophisticated ultrasound imaging equipment, explain the imaging procedure to patients, position them correctly, and perform the sonographic examination.

LYMPHATIC THERAPIST

The lifesaving therapy used to treat cancer can sometimes damage a patient's lymphatic system, leading to a painful, abnormal swelling in the soft tissues of the limbs called "lymphedema." Lymphatic therapists provide the highly specialized, complex decongestive therapy required to treat and manage lymphedema, and help patients avoid permanent disability.

ORTHOPTIST

Orthoptists conduct diagnostic tests and measurements on patients with visual disorders to help ophthalmologists design effective treatment plans. They also provide vision therapy. Many orthoptists work with children who have "crossed" eyes, "lazy" eye, double vision, and other eye coordination problems.

PEDORTHIST

Pedorthics is the design, manufacture, fit, and modification of footwear to help solve foot problems caused by defect, disease, overuse, or injury. Pedorthists are trained in foot and lower-limb anatomy, pathology, biomechanics, gait analysis, footwear fitting, and shoe construction. They fit patient footwear according to a doctor's prescription.

MORGUE TECHNICIAN

Death is a fact of life in any health care facility. Morgue technicians use basic forensic skills to assist pathologists during autopsies, prepare and sterilize the morgue equipment, transport and prepare bodies, and help ensure that the deceased person's wishes regarding organ donation are fulfilled.

TRAVEL NURSE

Registered nurses and nurse practitioners who love to travel can earn top salaries and often have moving and housing costs covered by temporarily working in locations where qualified nursing professionals are in short supply. Assignments typically last two to six months.



FLIGHT PARAMEDIC

Transporting trauma patients or the critically ill via air ambulance or helicopter requires the combined expertise of an emergency nurse and a paramedic. Most air medical programs are hospital-based. Flight paramedics need to be quick thinkers who work well under pressure and aren't afraid of heights.





Explore More

Use these websites and other Health Science career and education resources available from your school counselor to research health care careers.

AMERICA'S CAREER INFONET | www.acinet.org/acinet

Use this CareerOneStop site sponsored by the U.S. Department of Labor to watch videos about different Health Science careers and take online quizzes to see what jobs might fit you best.

ASPIRINGDOCS | www.aspiringdocs.org

This information-packed website is sponsored by the Association of American Medical Colleges (AAMC), the organization representing all 131 accredited U.S. medical schools and more than 400 major teaching hospitals. Get tips on preparing for and applying to medical school, find out if a career in medicine is right for you, and learn about summer medical and dental programs for college students.

BIOMEDICAL SCIENCE CAREERS PROGRAM | www.bscp.org

BSCP offers students from underrepresented minority groups the encouragement, support, and guidance needed to prepare for and succeed in competitive biomedical science careers. Resources include internship, mentoring, and scholarship opportunities for high school through postdoctoral students.

DISCOVER NURSING | www.discovernursing.com

Learn about different nursing specialties, find out what colleges offer nursing programs, read profiles of working nurses, and research available nursing scholarships.

EXPLORE HEALTH CAREERS | www.explorehealthcareers.org

Get up-to-date career and salary information about more than 100 health and allied health careers. Includes interactive links to health-related education/training programs, financial aid resources, specialized learning opportunities, and current issues in health care.

LIFEWORKS | science.education.nih.gov/LifeWorks.nsf/feature/index.htm

Browse more than 100 health and medical science career descriptions provided by the National Institutes of Health, and then connect with a LifeWorks e-mentor through the site's online mentoring program for U.S. high school and college students. Includes both video and print interviews with real Health Science professionals who share what it is like to work in their fields.

O*NET (OCCUPATIONAL INFORMATION NETWORK) | online.onetcenter.org

O*NET provides full information on careers, including state-by-state salary information and skill matching for students.

U.S. DEPARTMENT OF LABOR OCCUPATIONAL OUTLOOK HANDBOOK | www.bls.gov/oco

This interactive version of the *Occupational Outlook Handbook* (OOH) features updated information about what people in nearly every career in the world do, the wages they are paid, the conditions in which they work, the education requirements they have to meet, and other aspects of choosing a profession. (The descriptions of the 25 Health Science career ideas featured on pages 14 to 23 are excerpted from the public information in the OOH).

WHAT IS PUBLIC HEALTH? | www.whatispublichealth.org

Explore the growing career opportunities in public health, and learn how public health professionals help promote health, prevent disease, and protect the nation. Includes profiles of current public health professionals and links to U.S. public health schools.

STAFF SHORTAGES IN LABS MAY PUT PATIENTS AT RISK

BY LAURA LANDRO

The swine-flu outbreak has focused a spotlight on a looming risk for hospitals and their patients: a shortage of technicians to run critical lab tests.

Vanderbilt University Hospital's lab had to pull staffers from other parts of the hospital and ask technicians to work double shifts to test incoming patients for swine flu earlier this month. "It was all hands on deck for a week," says Michael Laposata, chief pathologist at the large medical center in Nashville, Tennessee....

...Like the growing shortages of primary-care doctors and nurses, the shrinking ranks of skilled lab workers pose a potential threat to the safety and quality of health care, medical experts warn. Hospitals say it currently can take as much as a year to fill some job openings. And the American Society for Clinical Pathology, which certifies lab professionals, says average job-vacancy rates currently top 50 percent in some states. The group is lobbying for federal and state funds to keep some academic training programs alive and raise awareness of the problem.

—*The Wall Street Journal*, May 13, 2009

Health Science Stories

MEDIA REPORTS

ABOUT THE

DEMAND FOR

HEALTH CARE

EMPLOYEES

NURSING SHORTAGE: MORE JOBS THAN RECRUITERS CAN FILL

New York Agency Describes Feeling the Pinch of a Looming Nursing Shortage

BY DAVID PEROZZI

No matter how many nurses walk through Michael Fazio's door looking for jobs, it's never enough. Despite a U.S. unemployment rate approaching 10 percent, Fazio's Manhattan-based company, Prime Staffing, which specializes in placing New York-based nurses, has such an extraordinary demand for nurses that it can't fill all of the vacancies.

"We're trying to engage nurses from around the country to come to New York and work for Prime Staffing," said Fazio, the company's president.

But even that might not be a wide enough net. The United States faces a looming national nursing shortage, according to the American Association of Colleges of Nursing.

In December 2009, workforce analysts with the Bureau of Labor Statistics projected that more than 581,500 new registered nurse (RN) positions would be created through 2018, which would increase the size of the RN workforce by a whopping 22 percent.

ABC News, August 14, 2010

BROAD DEMAND FOR HEALTH CARE WORKERS SEEN IN MOST U.S. MARKETS

BY JOHN COMMINS

The demand for health care workers appears to be accelerating in most areas of the nation, a new study shows.

Labor trends in 30 markets tracked by the consulting firm Health Workforce Solutions LLC (HWS) found demand growing fastest in Sacramento, Riverside/San Bernardino, Pittsburgh, Cleveland, and Dallas for the fourth quarter of 2009. The New York/Northern New Jersey area ranked at the bottom of the 30 markets tracked.

"After several slow quarters, we are now seeing notable movement across a number of markets as health care employers begin to ramp up again," said David Cherner, managing partner of San Francisco-based HWS. "With the health care reform picture finally becoming clearer, many forward-thinking organizations appear to be refocusing on their hiring needs at an opportune time before the competition for key clinical and ancillary personnel undoubtedly returns."

—*HealthLeaders Media*, January 15, 2010

EXPERTS PREDICT SEVERE SHORTAGE OF HEALTH CARE PROVIDERS IN 2014

BY CANDACE ADORKA

There is one primary care doctor for every 1,070 people in Illinois.

That ratio is even worse—one to more than 2,000 people—in certain areas the government considers health professional shortage areas.

Health professionals worry there will be an even greater shortage after 2014, when about 32 million more people are insured, as mandated by the health care reform law, and as the baby boomer generation becomes Medicare-aged.

"With health care reform, we won't have enough people to serve the communities," said Dr. Javette Orgain, assistant dean of University of Illinois at Chicago Medical School's Urban Health Program. "We have too many single-organ specialists like nephrology and neurology and cardiology, as opposed to those who can treat the whole person," she said.

—*Medill Reports*, Northwestern University, April 13, 2010

MEDICAL SCHOOLS CAN'T KEEP UP AS RANKS OF INSURED EXPAND, NATION FACES SHORTAGE OF 150,000 DOCTORS IN 15 YEARS

BY SUZANNE SATALINE AND SHIRLEY S. WANG

The new federal health care law has raised the stakes for hospitals and schools already scrambling to train more doctors.

Experts warn there won't be enough doctors to treat the millions of people newly insured under the law. At current graduation and training rates, the nation could face a shortage of as many as 150,000 doctors in the next 15 years, according to the Association of American Medical Colleges.

That shortfall is predicted despite a push by teaching hospitals and medical schools to boost the number of U.S. doctors, which now totals about 954,000.

The greatest demand will be for primary-care physicians. These general practitioners, internists, family physicians, and pediatricians will have a larger role under the new law, coordinating care for each patient.

The U.S. has 352,908 primary-care doctors now, and the college association estimates that 45,000 more will be needed by 2020. But the number of medical school students entering family medicine fell more than a quarter between 2002 and 2007.

—*The Wall Street Journal*, April 12, 2010



The two-year associate in science degree program

WYOMING

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